



CLIMATE ACTION PLAN

JANUARY 2018

Interim Revision NOVEMBER 2020



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City of Encinitas

Climate Action Plan

PREPARED BY:

The City of Encinitas

IN CONSULTATION WITH:

Ascent Environmental, Inc.

Energy Policy Initiatives Center

Prepared in partnership with the San Diego Association of Governments (SANDAG) and the Energy Roadmap Program. This Program is partially funded by California utility customers and administered by San Diego Gas & Electric Company under the auspices of the California Public Utilities Commission.

January 2018, revised November 18, 2020

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RESOLUTION 2020-98

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ENCINITAS APPROVING AND ADOPTING THE 2020 UPDATE OF THE CITY OF ENCINITAS CLIMATE ACTION PLAN

WHEREAS, the City of Encinitas is committed to the long-range goal of protecting the natural environment, increasing sustainability efforts, and improving overall quality of life;

WHEREAS, carbon dioxide (CO₂) and other greenhouse gases released into the atmosphere have a profound effect on the Earth's climate and reduction of the potential magnitude of climate change may lower its harmful effects on public health and safety;

WHEREAS, achieving greenhouse gas emission reductions to protect the climate is important to the City of Encinitas, which relies heavily on the stability of the climate for its environment, economy, and quality of life;

WHEREAS, in 2006, the State of California adopted the Global Warming Act of 2006 (Assembly Bill 32) which created a statewide greenhouse gas emission requirement and goal to reduce emissions to 1990 levels by 2020; and in 2016, California Senate Bill 32 established a new mid-term greenhouse gas reduction target of 40 percent below 1990 levels by 2030;

WHEREAS, local actions, whenever taken by cities and counties nationwide, can help provide a collective response and may also provide the benefits of testing and developing model programs, methods, and technologies for achieving greenhouse gas reductions;

WHEREAS, on March 9, 2011, the City Council of the City of Encinitas approved and adopted a Climate Action Plan;

WHEREAS, on January 18, 2018, at the recommendation of the Environmental Commission, the City Council of the City of Encinitas adopted an updated Climate Action Plan (2018 CAP);

WHEREAS, the 2018 CAP includes a greenhouse gas emission inventory and forecast, analysis and quantification of greenhouse gas reduction measures and targets, a defined process for implementation, monitoring and reporting of progress, and meaningful community engagement;

WHEREAS, the 2018 CAP includes a set of Strategies, Goals, Emission Reduction Targets, City Actions, Supporting Measures and Adaptation Strategies based on regional climate planning and consulting expertise, City staff knowledge, and Environmental Commission and public input;

WHEREAS, an Environmental Initial Study determined that the 2018 CAP would not have a significant impact on the environment and a Negative Declaration was prepared for the 2018 CAP which deemed the document a California Environmental Quality Act Qualified Climate Action Plan;

WHEREAS, on March 27, 2019, the City Council adopted its fifth cycle of Housing Element Update (HEU) which accommodates a maximum realistic yield of 2,494 additional dwelling units on 17 candidate sites within the City under build-out conditions;

WHEREAS, in accordance with mitigation measure GHG-2 of the HEU's Environmental Assessment, the City of Encinitas committed to updating the 2018 CAP within 20 months of the effective date of the HEU to reflect the impact of additional projected housing units on greenhouse gas (GHG) emissions;

WHEREAS, in October 2020, an updated greenhouse gas emissions analysis and forecast modeling was completed that incorporated the additional 2,494 dwelling units anticipated to be built within the City of Encinitas by 2030;

WHEREAS, revisions were made to the 2018 CAP to incorporate the updated analysis and modeling and incorporate recent updates to climate-related state and federal regulations and associated greenhouse gas emissions data;

WHEREAS, the proposed revisions to the 2018 CAP includes sufficient federal, state, and local greenhouse gas reduction measures to achieve the emissions reduction targets established in the 2018 CAP which align with the state of California's emissions reduction targets established by Senate Bill 32;

WHEREAS, an addendum to the final Negative Declaration for the 2018 CAP was prepared that incorporates the 2018 CAP revisions made in 2020 (Case No. ENV-004106-2020);

WHEREAS, the City Council considered the addendum with the adopted Negative Declaration prior to making a decision on the revisions to the 2018 CAP;

WHEREAS, greenhouse gas reduction actions contribute to the achievement of many of the City's environmental values and are consistent with the City's Environmental Policy, including promoting clean and efficient energy use, transitioning to greater proportion of renewable electricity sources, reducing vehicle miles traveled and promoting active transportation, implementing an organic waste recycling program and diverting solid waste from the landfill; promoting water conservation; and planning for anticipated future climate change impacts;

WHEREAS, many of the components of the revised 2018 CAP are under development or are currently being implemented by the City of Encinitas, including the formation of a community choice energy program, San Diego Community Power; the adoption of municipal codes mandating the construction of buildings that include energy and water efficient measures, renewable energy service, and electric vehicle charging; the installation of numerous bike and pedestrian infrastructure projects throughout the City to support alternative transportation; and the planting of more than 100 trees annually in City parks and rights of way;

WHEREAS, mechanisms employed and installed to reduce greenhouse gas emissions will also contribute to the economic vitality of the City through the development and use of clean technologies and the addition of local jobs.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED AND ORDERED by the City Council of the City of Encinitas that:

1. The 2018 Climate Action Plan, as revised in 2020, is a California Environmental Quality Act Qualified Climate Action Plan.
2. Based on its consideration, the City Council hereby determines that the adoption of the revisions to the 2018 Climate Action Plan is consistent with the provisions of the General Plan, the Local Coastal Program Land Use Plan, State law, and is in the public interest.
3. It is also understood that, where Climate Action Plan strategies and measures require ordinance or zoning code amendments, further evaluation and analysis will be conducted to determine adequacy prior to implementation.
4. The City Council adopts the addendum to the previously adopted Negative Declaration, which has been prepared in accordance with CEQA Guidelines 15162 and 15164, and finds that the proposed revisions to the 2020 Interim CAP Update would not result in significant environmental effects.

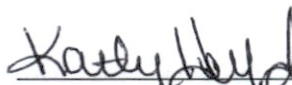
BE IT FURTHER RESOLVED that the City will pursue the greenhouse gas emission reduction goals and targets identified in the Climate Action Plan through the implementation of the identified CAP measures and by encouraging the community to support Climate Action Plan goals and targets through various actions, ordinances, policies, incentive-based programs, and education programs.

BE IT FURTHER RESOLVED that the City will monitor and report progress towards meeting greenhouse gas emission reduction goals and targets identified in the Climate Action Plan. Since all levels of government continue to monitor, lead and participate in activities, it may be necessary to adjust the measures described therein as necessary to ensure Assembly Bill 32 and other related legislation is fully implemented.

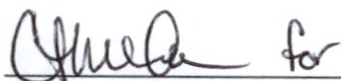
PASSED, APPROVED AND ADOPTED this 18th day of November 2020, by the City Council of the City of Encinitas, State of California.


Catherine S. Blakespear, Mayor

ATTEST:


Kathy Hollywood, City Clerk

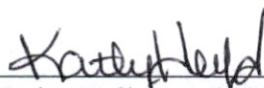
APPROVED AS TO FORM:



Leslie E. Devaney, City Attorney

CERTIFICATION: I, Kathy Hollywood, City Clerk of the City of Encinitas, California, do hereby certify under penalty of perjury that the foregoing Resolution was duly adopted at a regular meeting of the City Council on the 18th day of November, 2020 by the following vote:

AYES:	Blakespear, Hinze, Hubbard, Kranz, Mosca
NAYS:	None
ABSENT:	None
ABSTAIN:	None



Kathy Hollywood, City Clerk

ACKNOWLEDGEMENTS



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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
BAU	business-as-usual
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CalOES	California Office of Emergency Services
CAP	Climate Action Plan
CARB	California Air Resources Board
CDPH	California Department of Public Health
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	chlorofluorocarbons
CH ₄	methane
City	City of Encinitas
CNG	Compressed Natural Gas
CNRA	California Natural Resources Agency
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CoSMoS	Coastal Storm Modeling System
CSE	Center for Sustainable Energy
DWR	Department of Water Resources
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPIC	Energy Policy Initiatives Center
EVs	Electric vehicles
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
HFCs	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt hours
MHMP	Multi-Jurisdictional Hazard Mitigation Plan

Acronyms and Abbreviations

MPOs	Metropolitan Planning Organizations
MTCO ₂ e	metric tons of carbon dioxide equivalent
N ₂ O	nitrous oxide
O ₃	ozone
OMWD	Olivenhain Municipal Water District
OPR	Office of Planning and Research
PACE	Property Assessed Clean Energy
PFCs	perfluorocarbons
ppm	parts per million
PVs	photovoltaics
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SDWD	San Dieguito Water District
UHIE	Urban Heat Island Effect
USGS	U.S. Geological Surveys
UWWUI	urban-wildland interface
VMT	Vehicle Miles Traveled



Executive Summary

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A Climate Action Plan provides a comprehensive roadmap to address the challenges of climate change in the City of Encinitas (City). To combat the effects of climate change, the City will need to reduce greenhouse gas (GHG) emissions from activities within the City while supporting the community in adapting to and improving its resiliency to a changing climate over the long term. The City previously developed a CAP in 2011 (2011 CAP) based on a 2005 baseline inventory. The 2018 CAP has been prepared as an update to the 2011 CAP to account for new legislation, improved technology, and a more recent baseline inventory year of 2012.

The scientific consensus is that there is substantial evidence that human activity is the causal agent of global climate change and that significant reductions in human-caused GHG emissions are needed by the mid-21st century to prevent the most catastrophic effects of climate change (Intergovernmental Panel on Climate Change [IPCC] 2014). To this end, in 2006, the California Global Warming Solutions Act (Assembly Bill [AB] 32) established the State’s first target to reduce GHG emissions, which established a goal of lowering emissions to 1990 levels by 2020. California has been making steady progress and is expected to achieve the 2020 target through actions outlined in the California Air Resources Board (CARB) Scoping Plan; however, ongoing reductions in GHG emissions are needed.

In 2016, Governor Brown signed Senate Bill (SB) 32 into law, which established a new mid-term GHG reduction target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. The new 2030 target places California on a trajectory towards meeting its longer-term goal, which is to bring emissions down to 80 percent below 1990 levels by 2050.

In its Scoping Plan, CARB recognizes local governments as “essential partners” in achieving California’s goals to reduce GHG emissions. Local governments can implement climate strategies to address local conditions and issues and can engage citizens more effectively than the State. Local governments have broad jurisdiction and, in some cases, unique authorities through community-scale planning and permitting processes, discretionary actions, local codes and ordinances, outreach and education efforts, and local government operations. CARB contends that local government efforts are critical to supporting the State’s efforts to reduce emissions and can ultimately deliver additional emissions reductions beyond what State policy can, along with local economic benefits (CARB 2017). Climate action plans are an effective way for local governments to support the State in its GHG reduction efforts.

The key components of the climate action planning process are shown in Figure ES-1 and briefly summarized below:

1. Prepare a baseline GHG emissions inventory (provided in Chapter 2)
 - The baseline year of 2012 was established for the 2018 CAP.
 - Approximately 459,000 metric tons of carbon dioxide equivalent (MTCO₂e) were emitted by communitywide sources in the City in 2012.
 - The largest source of emissions was the on-road transportation sector which accounted for 53 percent of the inventory; the electricity sector, the next largest, accounted for approximately 25 percent of the inventory.

GHG Emission Sectors in 2012
Baseline Inventory:

1. On-Road Transportation (53%)
2. Electricity (25%)
3. Natural Gas (14%)
4. Solid Waste (3%)
5. Water (3%)
6. Off-Road Transportation (2%)
7. Wastewater (0.5%)

Note: Values may not add to totals due to rounding

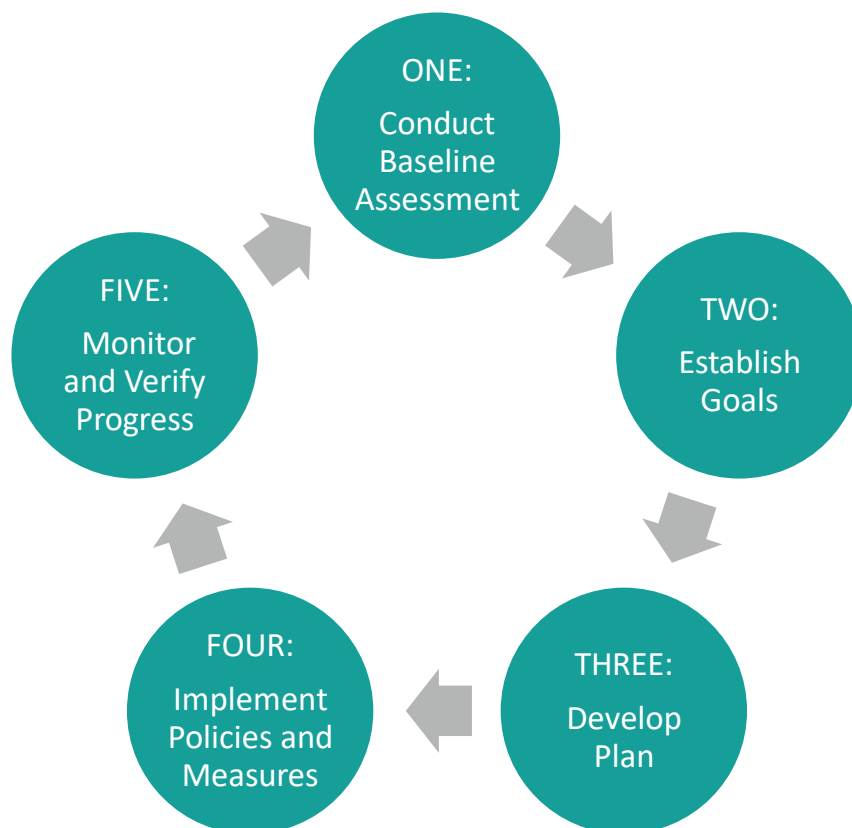


Figure ES-1: Climate Action Planning Milestones

2. Calculate GHG emissions forecasts and develop reduction targets (provided in Chapter 2)

- Future emissions were estimated based on business-as-usual (BAU) conditions. Without any actions taken by the City, GHG emissions are expected to increase by 2020 and 2030.
- GHG emissions reduction targets for the 2018 CAP were established consistent with State guidance:
 - Reduce emissions 13 percent below 2012 baseline levels by 2020; and
 - Reduce emissions 44 percent below 2012 baseline levels by 2030.
- Legislative actions by federal or State agencies help to reduce emissions in the future but are not sufficient to achieve the 2020 and 2030 targets.
- Achieving the 2020 and 2030 targets will require local action to help close the gap between legislative-adjusted emissions forecasts and the emissions limits established by the 2018 CAP targets.

The 2018 CAP contains a total of 19 local GHG reduction actions. The combination of all actions contributes towards achieving the 2020 and 2030 targets.

3. Identify local GHG emissions reduction strategies, goals, actions, and supporting measures to help the City achieve the 2020 and 2030 targets (provided in Chapter 3).

- GHG reduction strategies in the 2018 CAP are aligned with the GHG inventory sectors and include a total of 20 specific local GHG reduction actions.
- The top three measures in the 2018 CAP that will achieve the highest local GHG emissions reductions include:
 - CAP Measure RE-1: Establish a Community Choice Energy Program. This action will reduce emissions by 19,465 MTCO₂e by 2030.
 - CAP Measure ZW-1: Implement a Zero Waste Program. This action will reduce emissions by 2,830 and 9,216 MTCO₂e by 2020 and 2030, respectively.
 - CAP Measure CET-3: Improve traffic flow, promote active transportation, and plan for complete streets. This action would reduce emissions by 3,671 and 1,241 MTCO₂e by 2020 and 2030, respectively.
- Each strategy is supported by a number of non-quantifiable supporting measures. These are programs, policies, or projects the City will implement that will have an indirect effect on GHG emissions reductions.
- While the actions and supporting measures in the 2018 CAP are generally geared towards reducing GHG emissions, many will also result in health, environmental, and/or economic “co-benefits,” in addition to climate adaptation co-benefits.

The top three GHG reduction actions will reduce City emissions by a total of 6,501 and 29,922 MTCO₂e by 2020 and 2030, respectively.

Co-benefits are the collateral positive side effects that result from GHG reducing strategies and actions identified in the CAP.

4. Develop implementation and monitoring mechanisms that will help the City ensure the goals and targets are achieved (provided in Chapter 4).

- Implementation of the actions and measures in the 2018 CAP will require the City to develop and implement new ordinances, programs, and projects, or modify existing ones. This will require careful consideration of the operational and capital resources needed, as well as the timing and phasing of implementation. Chapter 4 outlines these considerations.
- Monitoring is an important aspect of the 2018 CAP to ensure that the City is on track to achieve the GHG reduction targets and desired outcomes for increasing resilience in the face of a changing climate. To this end, the City will need to review and update the GHG emissions inventory periodically (every two years), track the community’s progress on the implementation status of each action in the 2018 CAP, and conduct future CAP updates periodically (every five years).

Climate change is a global problem but one that must be addressed at the local level through partnerships and individual actions.

- Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. On a communitywide level, individuals and businesses can play an important role in combating climate change. By changing habits to consume less energy; producing less waste through recycling, organics processing, and conserving water; and driving less by choosing to carpool, take transit, or walk and bike more frequently, individuals and businesses can work towards reducing their carbon footprint. The combination of these small efforts can lead to better outcomes for the environment and the City.
5. Address climate change vulnerability with adaptation strategies that would improve community sustainability and resilience.
- Specific adaptation strategies are included in Chapter 5 to address the effects of climate change. Many of the strategies require the City and other partnering agencies to address climate-related risks as part of existing planning processes, as well as making incremental changes in the way City services and infrastructure are maintained and operated. Community education and awareness-building are also important components of the adaptation strategies.



CHAPTER 1

Introduction

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1.1 Climate Action Plan Overview

Climate Action Plans (CAPs) serve as comprehensive roadmaps that outline the specific activities that a community and municipality will take to reduce greenhouse gas (GHG) emissions and the potential impacts of climate change within the borders of a jurisdiction. In developing a CAP, jurisdictions evaluate the volume of GHGs emitted during a baseline year (2012 for this CAP) and determine the amount of emissions that need to be reduced to achieve statewide GHG reduction targets (discussed in further detail in Section 1.3, “Regulatory Framework”).

2011 CAP

In March of 2011, the City of Encinitas (the City) adopted the *City of Encinitas Climate Action Plan* (2011 CAP) to provide guidance to the City to achieve statewide reduction targets and to respond and adapt to the impacts of climate change. In 2009, the City partnered with members of the San Diego Regional Climate Protection Initiative, local governments in the County of San Diego, and Local Governments for Sustainability (ICLEI) to discuss how the region was going to monitor and address global climate change. This partnership facilitated the City’s initial GHG inventory for the year 2005, which served as the 2011 CAP’s baseline year. The 2005 baseline totaled 548,993 metric tons of carbon dioxide equivalent (MTCO₂e) emissions per year, or 8.78 MTCO₂e per year per capita. Under a business-as-usual (BAU) scenario which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions to reduce GHG emissions, the 2011 CAP determined that the City’s GHG inventory for 2020 would be 646,947 MTCO₂e per year or 9.5 MTCO₂e per year per capita. To achieve consistency with federal and State GHG reduction goals, the CAP specified that the City would reduce emissions 12 percent below 2005 levels by 2020, equivalent to reducing emissions by 164,159 MTCO₂e in 2020.

2018 CAP

On January 18, 2018, the City adopted an updated Climate Action Plan (2018 CAP) which built upon the goals of the 2011 CAP and provided a more recent inventory for the City (2012). As discussed in greater detail in Chapters 2 and 3, the inventory performed for 2012 demonstrated that the activities within the City emitted 459,000 MTCO₂e. Consistent with recommendations from the Assembly Bill (AB) 32 2008 Scoping Plan, the 2018 CAP established GHG emissions reduction target of 13 percent below 2012 levels by 2020 and a 41 percent below by 2030, in line with the statewide targets discussed in Section 1.3. As calculated in the 2018 CAP, this equates to reducing emissions by 53,232 MTCO₂e by 2020 and 197,724 MTCO₂e by 2030.

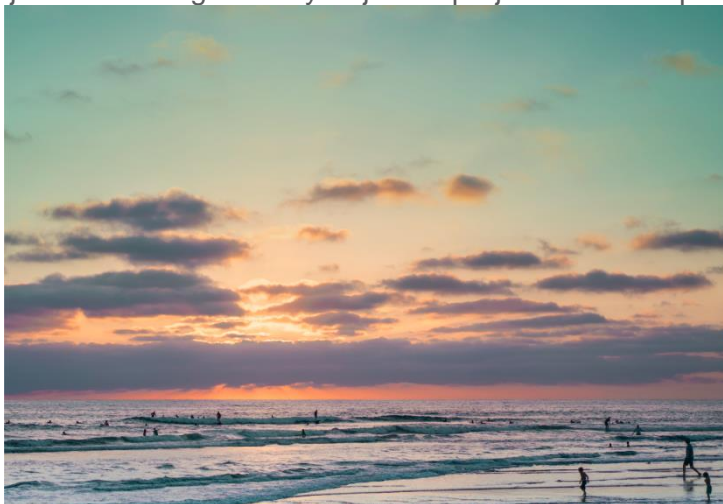
The 2018 CAP organized strategies, goals, and actions based on the sectors evaluated in the 2012 inventory (i.e., on-road transportation, electricity, natural gas, solid waste, water, off-road transportation, and wastewater). Strategies were developed to target improving the GHG efficiency of citywide community and municipal activities. For example, GHG reductions will be made through the incorporation of renewable energy in residential and nonresidential buildings while simultaneously improving the efficiency of such buildings. Specific actions and their supporting measures are outlined in Chapter 3 and their reductions disclosed.

The 2018 CAP represented an important step in acknowledging global climate change and its effects on the City. Chapter 2 includes details on the City’s baseline emissions inventory and projections and establishes reduction targets for 2020 and 2030. Chapters 3, 4, and 5 of the 2018 CAP include strategies, specific actions and supporting measures, and implementation and monitoring mechanisms to reduce GHG emissions and plan for climate change impacts. A more detailed comparison of the 2011 and 2018 CAPs is provided in Appendix C.

2020 Interim CAP Update

The City completed an update to its Housing Element in March 2019. The 2018 CAP committed to an update within 20 months of the effective date of the HEU to reflect the impact of anticipated housing units on greenhouse gas (GHG) emissions, in accordance with mitigation measure GHG-2 in the HEU Environmental Assessment, completed pursuant to California Government Code (GOV) § 65759. This most recent version of the CAP, adopted by City Council on November 18, 2020, incorporates the HEU residential units into the business-as-usual projection and legislatively-adjusted projection in Chapter 2 and presents associated updates and revisions to the CAP measures detailed in Chapter 3.

The next regular 5-year update is anticipated to occur in 2023, according to the CAP update cycle established in Chapter 4. The 5-year update will include a re-evaluation and re-alignment of the City's emissions reduction targets with current state guidance, including Executive Order B-55-18 which set a statewide target of achieving carbon neutrality by 2045.



1.2 Introduction to Climate Change Science

The greenhouse effect results from the concentration of atmospheric gases referred to as GHGs, which insulate the Earth and help regulate its temperature. The most prevalent GHGs in our atmosphere include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), chlorofluorocarbons (CFCs), and hydrofluorocarbons (HFCs). These gases serve as global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth stable. Without the greenhouse effect, Earth would not be able to support life as we know it.

Over the past two decades, human activities (e.g., the burning of fossil fuels for transportation and energy, increasing rates of deforestation and development) have contributed to elevated concentrations of GHGs in the atmosphere. Human-caused (i.e., anthropogenic) emissions of GHGs have resulted in above-normal ambient concentrations of GHGs, intensifying the greenhouse effect, and leading to a trend of abnormal warming of the Earth's climate known as *global climate change*. There is a strong scientific consensus that there is substantial evidence to indicate that most of the changes in the Earth's climate during the last 50 years are a result of anthropogenic GHG emissions (Intergovernmental Panel on Climate Change [IPCC] 2014: 3, 5). Global climate change, in turn, is the driver behind changes in precipitation patterns, rising temperatures, shrinking polar ice caps, sea-level rise, and other impacts to biological resources and humans. Chapter 3 of the 2018 CAP summarizes the City's GHG emissions and local contribution to global climate change.

Climate change is a global problem and can lead to significant fluctuations in regional climates. While there is consensus that global climate change is occurring and that it is exacerbated by human activity, there is less certainty as to the timing, severity, and potential consequences of climate change phenomena, particularly at the local level. Chapter 5 of the 2018 CAP discusses the predicted climate change effects in the City and recommends strategies to adapt to climate change.

1.3 Regulatory Framework

In response to the threat of global climate change, the State and City have already taken several steps to both reduce GHG emissions and adapt to climate change. These efforts, and the legislative background summarized in the following sections, provide important policy drivers and context for the 2018 CAP.

1.3.1 California

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

On April 20, 2015, Governor Edmund G. Brown Jr. signed EO B-30-15, establishing a new GHG emissions reduction target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 28-nation European Union which adopted the same target in October 2014. EO B-30-15 also directed CARB to update the AB 32 Scoping Plan to reflect the path to achieving the 2030 target. In September 2016, Governor Brown also signed Senate Bill (SB) 32, which codified into statute the mid-term 2030 target established by EO B-30-15. The new 2030 GHG emissions reduction target places California on a trajectory towards meeting the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050.

On December 14, 2017, CARB released the final *2017 Climate Change Scoping Plan Update* (2017 Scoping Plan Update), which lays out the framework for achieving the 2030 reductions as established in EO B-30-15 and SB 32. The 2017 Scoping Plan Update identifies GHG reductions by emissions sector to achieve a statewide emissions level that is 40 percent below 1990 levels by 2030.

In addition to legislation setting statewide GHG reduction targets, SB 375, signed by Governor Schwarzenegger in 2008, better aligned regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocations in each MPO's Regional Transportation Plan (RTP). CARB, in consultation with the MPOs, provides each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035. The San Diego Association of Governments (SANDAG) adopted *San Diego Forward: The Regional Plan* that integrates the RTP and SCS in October 2015.

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

Other federal and State regulations relevant to the 2018 CAP are identified below:

Table 1-1 Relevant Federal and State Regulations

Federal	Federal Clean Air Act (CAA)	In 2007, the U.S. Supreme Court ruled that CO ₂ is an air pollutant as defined under the CAA, and the U.S. Environmental Protection Agency has the authority to regulate emissions of GHG.
Federal	Corporate Average Fuel Economy (CAFE) Standards	The federal CAFE Standards determine the fuel efficiency of certain vehicle classes in the U.S.
State	SB 97	The State Office of Planning and Research prepared, and the Natural Resources Agency adopted, amendments to the State California Environmental Quality Act (CEQA) Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (Appendix G) and the Energy Conservation Appendix (Appendix F) provide a framework to address global climate change impacts in the CEQA process; State CEQA Guidelines Section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
State	California Building Efficiency Standards Title 24 Part 6	The California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.
State	AB 1493	AB 1493 (Pavley) required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks.
State	AB 197	AB 197 creates a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing GHGs at the local level.
State	SB 350	SB 350 requires the State to set GHG emission reduction targets for the load-serving entities through Integrated Resource Planning. SB 350 requires an increase in the Renewable Portfolio Standard to 60 percent by 2030 and doubling energy savings in electricity and natural gas end uses.
State	Advanced Clean Cars Program	In January 2012, CARB approved the Advanced Clean Cars program, which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025.
State	SB X1-2	SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 mandates that renewables supplied to the California grid from sources within, or directly proximate to, California make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.
State	SB 379	Beginning January 1, 2017, SB 379 requires California cities and counties, upon the next revision of their local hazard mitigation plan, to include climate adaptation and resiliency strategies in the safety elements of their general plans. The bill requires the safety element update to include a set of goals, policies, and objectives for their communities based on a vulnerability assessment, as well as implementation measures to increase community resilience to climate change. The safety element update can incorporate these components by reference from an adopted local hazard mitigation plan and/or climate adaptation plan.
State	SB 1383	SB 1383 established statewide waste reduction targets to achieve a 50 percent reduction in the disposal of organic waste from 2014 levels by 2020 and a 75 percent reduction by 2025. The law also requires 20 percent of edible food waste to be recovered for human consumption by 2025. CalRecycle was given regulatory authority and establish regulations by which local municipalities must comply.
State	AB 1826	<u>AB 1826</u> requires all businesses to recycle their organic waste materials by April 1, 2016. This mandate helps California in achieving their overall waste diversion (75% by 2020) and greenhouse gas emission reduction goals.

Table 1-1 Relevant Federal and State Regulations		
State	AB 341	AB 341 sets forth the requirements of the statewide mandatory commercial recycling program. Municipal jurisdictions must implement a commercial solid waste recycling program that consists of education, outreach and monitoring of businesses, and report the progress achieved.

1.3.2 City of Encinitas

The City is actively engaged in addressing climate change, sustainability, and reductions in GHG emissions. The 2011 CAP quantified GHG emissions for 2005 and provided a forecast for 2020. Based on this analysis, the City adopted both GHG reduction and climate change adaptation measures to demonstrate consistency with statewide goals set forth in AB 32.

The 2011 CAP included six strategies from the transportation, residential building, non-residential building, solid waste, water, and municipal operations sectors. Examples of GHG- reducing actions adopted as a component of the 2011 CAP include the deployment of a Bikeway Master Plan and a Green Building Incentive Program, new requirements for inclusion of solar photovoltaics for residential and non-residential buildings, and inclusion of transportation demand management strategies for municipal operations. These measures, as well as others not listed here, have been or are in the process of being implemented.

The 2018 CAP builds upon this past effort by creating a GHG inventory for 2012 and forecasting emissions for 2020, 2030, and 2050 consistent with current legislated targets and State Executive Order goals. Emissions reduction measures for the 2018 CAP were developed, in part, by evaluating the 2011 CAP measures to assess their current applicability and relevance. Reduction measures from the 2011 CAP were significantly reworked, while obsolete measures were removed and replaced with new actions and supporting measures. The emissions reduction measures in the 2018 CAP include applicable measures from the 2011 CAP and new actions and measures necessary to meet the 2020 and 2030 GHG reduction targets. A comparison of measures and actions from the 2011 and 2018 CAPs is provided in Appendix C. The 2020 interim CAP update further refined the emissions reduction measures based on revisions required for consistency with state and federal requirements and to ensure CAP measures reflect to the most current climate science and climate action opportunities.



Relationship to CEQA

CEQA is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. In 2007, California’s lawmakers enacted SB 97, which expressly recognizes the need to analyze GHG emissions as part of the CEQA process. SB 97 required the Governor’s Office of Planning and Research (OPR) to develop recommended amendments to address GHG emissions as an environmental effect.

CAPs are considered a “project” subject to compliance with CEQA because they are activities undertaken by a public agency that are subject to discretionary approval and may cause direct or

indirect effects on the environment. SB 97 clarified that GHG emissions are within the scope of environmental review. CAPs include strategies that can change the physical environment and influence development patterns that affect GHG emissions.

In response to the mandate of SB 97, the CEQA Guidelines (specifically Section 15183.5) establish standards for the contents and approval process of plans to reduce GHGs. With associated CEQA coverage, the 2018 CAP and the 2020 interim CAP update has been prepared consistent with those standards. As a CEQA Section 15183.5-qualified plan, the 2018 CAP affords development applicants the opportunity to use CEQA streamlining tools for analysis of GHG emission and related impacts for projects that are consistent with the 2018 CAP.

1.4 Community Action and Co-Benefits

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

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

Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. The 2018 CAP serves as a resource and starting point to support long-term community sustainability efforts. The City is committed to implementing the action to advance equality and reduce disparities. Opportunities to participate and share the benefits of the City's actions will be inclusive for all City residents. For instance, incentive programs to implement CAP measures and supporting measures will be available to all City residents, regardless of income levels. In addition, the City will promote existing State and local incentive programs specifically targeted towards low-income communities. Impacts of climate change can disproportionately affect disadvantaged communities and the City will work to proactively identify them and implement strategies to reduce impacts. Additional detail will be provided in an implementation plan developed in early Fiscal Year (FY) 2017-18.

While the actions and supporting measures included in the 2018 CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic “co-benefits.” Environmental co-benefits include improvements to air quality, water supplies, and biological resources; public health outcomes; and beneficial outcomes for other resources. For example, a significant co-benefit of implementing 2018 CAP strategies related to reductions in motor vehicle use and associated fuel combustion will result in fewer toxic air contaminants, leading to better air quality and improved health for everyone. Other strategies focus on improving energy and water-use efficiency in new and existing buildings, lowering overall housing and operation costs for residents and businesses.

Co-benefits are the complementary, positive side effects that would result from strategies, actions, and measures identified in the CAP.

1.5 Climate Action Plan Update

The City's 2011 CAP was adopted by council on March 9, 2011 to serve as a guiding document that outlines the course of action for identifying and implementing strategies to achieve citywide reductions in GHG emissions for both municipal and community operations. The 2011 CAP was designed to:

- Benchmark where the City currently stands relative to statewide emission goals.
- Provide a roadmap for achieving statewide GHG emissions reduction targets.
- Create a plan that meets specific city-wide needs and objectives.
- Provide guidance for the City to respond and adapt to the impacts of climate change.

In January 2016, direction to update the City's Climate Action Plan was included in the City's FY 2015-16 and 2016-17 Work Program and in March 2016, staff was assigned to update the plan. This substantial update was adopted by Council on January 17, 2018. Another, interim update was prepared in 2020 to address the City's updated Housing Element completed in March 2019, in accordance with mitigation measure GHG-2 in the HEU Environmental Assessment, completed pursuant to California Government Code (GOV) § 65759. This most recent update of the CAP was adopted by City Council on November 18, 2020.

1.5.1 Climate Action Plan Update Elements

The 2018 CAP outlines a course of action for the City to reduce community-wide GHG emissions, as well as prepare for and adapt to climate change.

The overarching goals of the 2018 CAP are to:

- Reduce GHG emissions from the on-road transportation, electricity, natural gas, solid waste, water, off-road, and wastewater sectors
- Identify adaptation strategies for City government, businesses, and residential sustainability

The GHG reduction targets for the City were developed based on State goals embodied in AB 32, SB 32, and EOs B-30-15 and S-3-05. The 2018 CAP aims to achieve the following local community-wide GHG reduction targets:

- 13 percent below 2012 levels by 2020
- 44 percent below 2012 levels by 2030

To achieve these objectives, the 2018 CAP identifies the following:

- A summary of baseline GHG emissions and the potential growth of these emissions over time
- The expected climate change effects on the City
- GHG emissions reduction targets and goals to reduce the community's contribution to global warming

- Identification of strategies, specific actions, and supporting measures to comply with statewide GHG reduction targets and goals, along with strategies to help the community adapt to climate change impacts.

As part of the 2018 CAP implementation, each strategy, action, and supporting measure will be continually assessed and monitored. Reporting on the status of implementation of these strategies, periodic updates to the GHG emissions inventory, and other monitoring activities will help to ensure that the 2018 CAP is making progress. See Chapter 4 for more information on administering, implementing, and monitoring the 2018 CAP.

1.5.2 Climate Action Plan Update Process

As part of the 2018 CAP update, the City developed and implemented a Public Outreach and Engagement Plan (included as Appendix D) providing local residents, stakeholders, interested parties, and other agencies and/or individuals with the opportunity to participate in the climate action planning process. The goals of outreach and engagement are to: (1) raise awareness of the 2018 CAP update; (2) educate the public and other organizations about the 2018 CAP; (3) provide opportunities for input at the various steps of 2018 CAP development; (4) provide opportunities to influence decision-making; and (5) provide a public process that meets the CEQA Guidelines' requirements for a Plan for the reduction of GHG emissions. The rationale for each of these goals includes the following principles:

- *Awareness* – Stakeholders must be aware of the planning process before they can participate.
- *Education* – Stakeholders must be educated and knowledgeable about the 2018 CAP and planning process before they can participate effectively.
- *Input* – Stakeholders' knowledge and perspectives help the planning team verify or expand on available information.
- *Decision-making* – Stakeholders are encouraged to engage in the decision-making process.
- *Open and public process* – As stated in CEQA Guidelines Section 15183.5 (b)(1)(F), a “qualified” GHG reduction plan must be adopted in a public process. Once adopted, the updated 2018 CAP would represent a qualified plan for reduction of GHG emissions, consistent with the requirement set forth in the *CEQA Guidelines* section cited above, and would support tiering of future development projects for purposes of CEQA review of GHG impacts.



Having a clear process by which the public can be involved, review, and comment on the 2018 CAP resulted in a better document that can be used to streamline CEQA analysis and compliance for many types of projects in the City.

2018 CAP Workgroup Meetings

Internal feedback and review was facilitated through the CAP Workgroup. The CAP Workgroup is composed of staff members of the following departments: City Manager's Office, Development Services, Public Works, Human Resources, Information Technology, Finance, San Dieguito Water District, Parks, Recreation and Cultural Arts, and Fire and Marine Safety. The CAP Workgroup's responsibilities include reviewing and providing comments and recommendations for key work products; providing recommendations for the feasibility of 2018 CAP measures; and using local expertise to offer recommendations of new and revised 2018 CAP measures and goals. The CAP Workgroup met biweekly through the CAP update process to serve these functions.

Environmental Commission and City Council Meetings

At the Environmental Commission's regular monthly meetings, the CAP Program Administrator briefed the commission on the status and progress of the Climate Action Plan update process. In these meetings, the Environmental Commission discussed preliminary GHG results, proposed reduction targets, and the preliminary list of GHG reduction actions and provided comments to staff. The Environmental Commission also convened their Ad-Hoc Subcommittee on the Climate Action Plan Update to review draft elements of the 2018 CAP update and provide recommendations. The Environmental Commission reviewed the draft list of CAP Measures and Supporting Measures on May 11, 2017 and unanimously approved the list with minor revisions. The draft list forms the foundation of the 2018 CAP update. City Council members were briefed on 2018 CAP update progress at Council meetings on January 18 and April 26, 2017. For the 2020 interim CAP update, City staff again met with and received input from the Environmental Commission's CAP Subcommittee. The proposed draft of the 2020 interim CAP update was considered by the Environmental Commission at their meeting on October 8, 2020 and the Commission voted unanimously to recommend that the updated CAP be taken to City Council for adoption.

Public Workshops

The City hosted two public workshops on February 21 and March 1, 2017 to share information with the community on the 2018 CAP and to receive public input on specific measures and actions that the City can implement to reduce GHG emissions. These workshops have been centered on a number of posters that provided an overview of potential actions and measures that the City can implement to engage 2018 CAP strategies and accomplish goals. Additionally, on February 21, 2017, a PlaceSpeak topic was posted to gather public input using an online platform, to provide the same information on the 2018 CAP process and receive input on the proposed reduction strategies; identical to those evaluated at the public workshops. All comments received were tracked and evaluated for inclusion in the 2018 CAP. A majority of comments were incorporated into the 2018 CAP. See Appendix E for a summary of public input received.

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CHAPTER 2

Greenhouse Gas Emission Inventory, Projections, and Targets

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This chapter summarizes the community's contribution to global climate change by offering a detailed accounting of greenhouse gas (GHG) emissions within the City of Encinitas (City). It includes a discussion of the primary sources and annual levels of GHG emissions from 2012 (i.e., baseline inventory); describes likely trends if emissions are not reduced for 2020, 2030, and 2050 (i.e., projections); and sets a roadmap forward to reduce emissions for 2020 and 2030 (i.e., targets). Emissions from community activities are discussed in Sections 2.2 through 2.4.

2.1 Why Prepare a Greenhouse Gas Emissions Inventory?

Recent increases in global temperatures are highly correlated with elevated GHG emissions resulting from human activities. Per the scientific community, to avoid “dangerous climate change” in the Earth’s climate system, GHG emissions will need to be stabilized so that global temperatures do not increase more than 3.6 degrees Fahrenheit (°F) (2 degrees Celsius [°C]) above pre-industrial levels. To achieve this outcome, global carbon dioxide (CO₂) concentrations must be stabilized at 450 parts per million (ppm) (Intergovernmental Panel on Climate Change [IPCC] 2014).

The inventory baseline is used to:

- Project emissions
- Develop reduction targets
- Develop, evaluate, and implement strategies to achieve the targets

One of the main objectives of the 2018 Climate Action Plan (2018 CAP) is to identify and reduce local contributions to global GHG emissions. This chapter is intended to serve as a foundation for the strategies and actions that will implement the City’s commitment to reduce emissions. Measuring GHG emissions is a critical first step in developing the 2018 CAP for several reasons. First, the GHG inventory identifies major sources and quantification of GHG emissions associated with the activities and choices currently made by residents, businesses, and municipal operations. Second, the inventory provides the baseline that is used to project emissions trends and to develop accurate reduction targets and interim goals consistent with State objectives. Finally, the inventory sets the baseline for the City to develop, evaluate, and implement strategies and actions to achieve its targets and goals.

The GHG emissions inventory also plays a role in ensuring that the City stays on course to meet the GHG reduction targets. After the 2018 CAP is adopted, the City will prepare regularly updated GHG emissions inventories that will be compared to the baseline inventory. This will track the City’s progress in reducing emissions as 2018 CAP actions are implemented.

The emissions inventory is limited to GHGs that are generated from activities within the City from a defined set of sources (e.g., electricity and natural gas use, transportation, waste) that can be readily monitored and reduced through quantifiable CAP Measures.

The inventory establishes 2012 as the baseline year from which the City determines GHG reduction targets. The baseline year aligns with the base year for the San Diego Association of Governments (SANDAG) travel demand model. Appendix A and Appendix G provides additional information on baseline year selection and inventory methodologies.

2.2 Baseline Inventory

The first step in the City's climate action planning process is to understand the sources and amount of GHG emissions generated from activities occurring within the City. A GHG emissions inventory is an estimate of the emissions of a defined set of gases (e.g., CO₂, methane [CH₄], nitrous oxide [N₂O]) that contribute to global climate change. The emissions inventory prepared for the 2018 CAP is limited to emissions that are generated from activities within the City from a defined set of sources (e.g., transportation, electricity use, waste disposal, etc.). These include emissions that are within the City's jurisdictional control and can be readily estimated, monitored, and reduced by City action while supporting the efforts of residences and businesses.

The City's previous CAP (2011 CAP), developed the initial GHG inventory for the year 2005. The 2005 baseline totaled 548,993 metric tons of carbon dioxide equivalent (MTCO₂e) per year, or 8.78 MTCO₂e per year per capita. Under a business-as-usual (BAU) scenario which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions to reduce GHG emissions, the 2011 CAP determined that the City's GHG inventory for 2020 will be 646,947 MTCO₂e per year or 9.5 MTCO₂e per year per capita. To achieve consistency with federal and State GHG reduction goals, the 2011 CAP specified that the City will be required to reduce emissions 12 percent below 2005 levels by 2020, equivalent to reducing emissions by 164,159 MTCO₂e in 2020. The 2005 inventory was organized by the following emissions sectors: transportation (70 percent of total emissions), residential buildings (15 percent), commercial and industrial buildings (11 percent), solid waste (3 percent), wastewater (0.6 percent), and municipal operations (0.4 percent).

The City's 2012 GHG emissions Inventory has seven emission sectors:

1. On-Road Transportation;
2. Electricity;
3. Natural Gas;
4. Solid Waste;
5. Water;
6. Off-Road Transportation; and
7. Wastewater.

The 2012 emissions inventory performed for the 2018 CAP evaluated emissions from the following sectors as summarized in Figure 2-1 and discussed below:

- **On-road transportation:** Emissions associated with passenger cars; light-, medium-, and heavy-duty trucks; buses; mobile homes; and motorcycles.
- **Electricity:** Emissions from building energy use associated with electricity in residential, commercial, and industrial buildings.
- **Natural gas:** Emissions from building energy use associated with combustion of natural gas in residential, commercial, and industrial buildings.
- **Solid waste:** Emissions from the disposal of organic materials in landfills and community-generated mixed waste from residences and business in the City.
- **Water:** Emissions associated with the energy consumed during treatment, transport, and distribution of water.
- **Off-road transportation:** Emissions from air and water vessels, heavy-duty construction equipment (e.g., excavators, cranes, dozers), landscaping equipment, and other off-road equipment.
- **Wastewater:** Fugitive emissions resulting from the treatment process for domestic sewage.

Further details regarding sources and methodology for the 2012 inventory can be found in Appendix A and Appendix G.

Notably, residents, businesses, and organizations make daily choices that result in GHG emissions and may be beyond the influence of the City or the 2018 CAP; however, individual residents or businesses should not feel limited to only the identified strategies, which are focused on the City’s inventoried emissions. As such, community members are encouraged to engage in climate-friendly actions such as purchasing locally-sourced foods and products to reduce transportation emissions or install efficient or clean-energy appliances and infrastructure to lower energy-related emissions. The City’s contribution to global climate change can be reduced through efforts at the individual level beyond what is described in the 2018 CAP.

2.2.1 City of Encinitas 2012 Greenhouse Gas Emissions

The 2012 GHG emissions inventory accounts for six primary GHGs: CO₂, CH₄, N₂O, sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs); however, each GHG has varying levels of potency in the atmosphere. To simplify discussion and comparison of these emissions collectively, CAPs use a measurement referred to as carbon dioxide equivalent (CO₂e).

CO₂e translates each GHG to an equivalent volume of CO₂ by weighting it by its relative global warming potential (GWP). For example, per IPCC’s Fourth Assessment Report, CH₄ and N₂O are 25 and 298 times more potent, respectively, than CO₂ in their ability to trap heat in the atmosphere (IPCC 2007). Converting these gases into CO₂e allows consideration of all the gases in comparable terms to make it easier to communicate how various sources and types of GHG emissions contribute to climate change. A metric ton of CO₂e (MTCO₂e) is the standard measurement of GHG emissions.

In 2012, community and municipal activities in the City generated 459,000 MTCO₂e. The sector with the greatest contribution to global climate change was on-road transportation accounting for 53 percent of the City’s total GHG emissions or 244,172 MTCO₂e. The electricity and natural gas sectors contributed 25 and 14 percent of the City’s overall emissions, or 113,556 and 62,027 MTCO₂e, respectively.

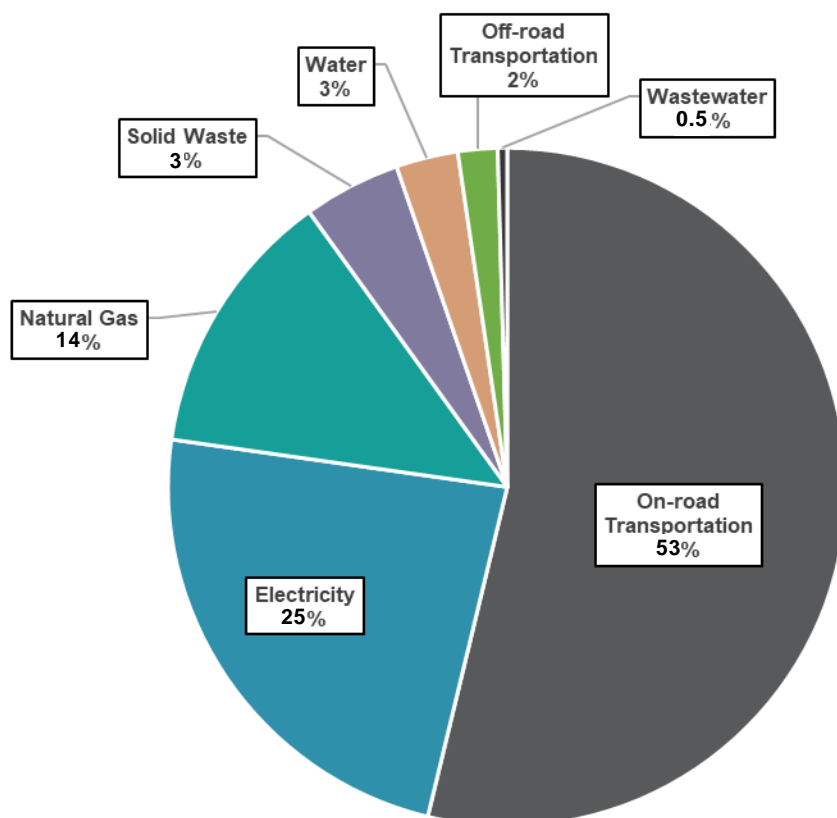
To put these emissions into perspective, 459,000 MTCO₂e is equivalent to combusting 51.6 million gallons of gasoline, combusting 253,000 tons of coal, or a year’s worth of carbon sequestration from 599,000 acres of U.S. forests (U.S. Environmental Protection Agency [EPA] 2020).

Breakdown of Emitting Sectors in 2012:

1. On-Road Transportation (53%)
2. Electricity (25%)
3. Natural Gas (14%)
4. Solid Waste (3%)
5. Water (3%)
6. Off-Road Transportation (2%)
7. Wastewater (0.5%)

Note: Values may not add to totals due to rounding

The City’s 2012 emissions are equal to combusting 51.6 million gallons of gasoline, combusting 253,000 tons of coal, and losing the carbon sequestration potential from 599,000 acres of forest.



Energy Policy Initiatives Center, 2020

Figure 2-1: Greenhouse Gas Inventory for the City of Encinitas in 2012 by Emission Sector

Additional details related to the specific emission sectors, data sources, assumptions, and methods can be found in Appendix A. Figure 2-1 above and Table 2-1 below show the breakdown of the City's GHG emissions in 2012.

Emissions Sector	MTCO₂e	Percent (%)
On-Road Transportation	244,172	53
Electricity	113,556	25
Natural Gas	62,027	14
Solid Waste	13,610	3
Water	14,299	3
Off-Road Transportation	9,138	2
Wastewater	2,155	0.5
Total	459,000	100

Notes: Columns may not add to totals due to rounding.
MTCO₂e = metric tons of carbon dioxide equivalent
Source: EPIC 2017, 2020.

2.3 Emission Projections

GHG emissions projections provide an estimate for future levels based on a continuation of current trends in activity, while also accounting for known regulatory actions by federal and State agencies (i.e., “legislative” actions) that can reduce emissions in the future if implemented. Through GHG projections, communities gain insight into the scale of local reductions needed to achieve statewide GHG reduction targets, in addition to legislative actions.

The first step in preparing comprehensive GHG emissions projections is the development of a BAU scenario, which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions beyond what has already been adopted at the time of the baseline year (i.e., 2012). Namely, federal, State, and local policies, programs, and regulations designed to take effect in future benchmark years (e.g., 2020, 2030), and the GHG reductions that will occur with their implementation, are not considered. The BAU model also assumes the population, housing, employment, and transportation activity will grow over time, consistent with projections. Further, the BAU model does not account for GHG emission reductions that will occur through implementation of the 2018 CAP.

The business-as-usual (BAU) GHG emissions forecasts in the CAP assume a continued increase in population, housing units, employment, and vehicle activity. Projections are based on SANDAG’s Series 13 Regional Growth Forecast.

Using these parameters, BAU projections were developed for the years 2020 and 2030. GHG estimates were determined to be 388,000 MTCO₂e in 2020 and 386,000 in 2030 based on analysis conducted for the 2020 interim CAP update. Details regarding BAU assumptions and methodology can be found in Appendix A and Appendix G. Notably, the 2030 BAU projection now accounts for future increased housing units in Encinitas as a result of the 2019 Housing Element Update.

2.3.1 Demographic Trends

GHG emission projections were estimated for 2020 and 2030 using City-specific demographic and vehicle projections from the San Diego Association of Governments’ (SANDAG’s) Series 13 Regional Growth Forecast, which was updated to include the impact of City’s 5th Cycle Housing Element Update.

The City’s population is expected to increase by 6% in 2020, 14% in 2030.

The City is expected to experience modest population growth by 2020 and 2030, as reflected in the emissions projections. Based on data used by the Energy Policy Initiatives Center (EPIC) to estimate projections, the City’s population is expected to increase by 6 percent in 2020, and 14 percent in 2030, as compared to 2012 population levels. Total jobs are expected to increase by 4 percent by 2020 and 4 percent by 2030 as compared to 2012 job levels. Further details on the underlying SANDAG data used for emissions projections can be found in Appendix A and G.

The milestone years of 2020 and 2030 were selected for BAU projections to provide a comprehensive picture of the City’s short-term and long-term emissions levels without considering reductions realized through federal and State regulations. Further, 2020 and 2030 represent benchmark years in terms of achieving reductions goals (i.e., 1990 levels of GHGs by 2020 as mandated by Assembly Bill [AB] 32, 40 percent below 1990 levels of GHGs by 2030 as mandated by Senate Bill [SB] 32). As such, certain legislative-related reductions will be anticipated to occur by 2020 and 2030. A BAU scenario including emissions reductions from legislative action was not modeled for 2050 because of the inherent uncertainty regarding political climate, advances in technology and climate science,

and efficacy of existing or planned programs. Therefore, projecting a BAU scenario for the years 2020 and 2030 will serve as the basis for the remainder of the climate action planning process.

2.3.2 Legislative Reductions

The second step in the climate action planning process is to model future emissions for benchmark years (i.e., 2020 and 2030) including a variety of legislative actions targeting future GHG reductions without any additional local governmental action contained in the 2018 CAP. The applied legislative reductions include:

- California Renewables Portfolio Standards
- California Solar Policies and Programs
- California Energy Efficiency Standards
- Federal and California Vehicle Efficiency Standards

A detailed description and analysis of how specific legislative reductions are included in the City's BAU GHG emissions inventory and projections can be found in Appendix A, B and G. Table 2-2 below shows the summary of the City's projected BAU GHG emissions with and without legislative action for the years 2020 and 2030.

Table 2-2 City of Encinitas Emissions Business-as-Usual and Legislative-Adjusted Projections (MTCO₂e/year)

Emissions Sector	2012	2020 ²		2030 ³	
		BAU Projection	Legislative-Adjusted Projection	BAU Projection	Legislative-Adjusted Projection
On-Road Transportation	244,172	229,059	213,334	200,051	171,343
Electricity	113,556	122,176	87,737	88,193	29,988
Natural Gas	62,027	72,446	69,378	64,702	57,574
Solid Waste ¹	13,610	24,575	24,575	15,819	15,819
Water	14,299	15,055	15,055	4,409	4,409
Off-Road Transportation	9,138	8,943	8,943	11,941	11,941
Wastewater	2,155	2,460	2,460	1,227	1,227
Total	458,957	474,712	419,873	386,341	292,300
Change from 2012 (%)	-	3.4%	-8.5%	-16%	-36%

Notes: Columns may not add to totals due to rounding. BAU = business as usual, GHG = greenhouse gas emissions, MTCO₂e = metric tons of carbon dioxide equivalent, CAP=climate action plan.

¹ The solid waste sector includes emissions from solid waste disposal in landfills and waste-in-place emissions from the closed Encinitas Landfill.

²Source: Appendix A, EPIC 2017.

³Source: Appendix G, EPIC 2020.

2.3.3 Business-as-Usual Greenhouse Gas Emissions Projections with Legislative Reductions

Implementation of the legislative actions listed above will contribute to reductions in GHG emissions in the City, as shown in Table 2-2. By 2020, emissions are projected to decline by approximately 8.5

percent below 2012 levels; by 2030, emissions are projected to decrease by approximately 36 percent as compared to 2012 levels. The overall decrease in emissions is because of federal and State policies existing in the baseline year of 2012.

2.4 Reductions Targets

The 2018 CAP aims to reduce GHG emissions by 13 percent below 2012 levels by 2020 and 44 percent by 2030. As directed by AB 32, SB 32, and Executive Orders S-3-05 and B-30-15, the State targets a reduction in statewide GHG emissions of:

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

AB 32, SB 32, and EO B-30-15 use 1990 levels as a benchmark to identify statewide reduction targets. Because the City's 1990 emissions level was not estimated, proportional targets for the City's CAP were developed from the 2012 baseline that are consistent with direction from the 2008 Scoping Plan.

The California Air Resources Board (CARB) released the *2017 Climate Change Scoping Plan Update* (proposed 2017 Scoping Plan Update) pursuant to AB 32 and SB 32. The proposed 2017 Scoping Plan Update concluded that the State's emissions goal of 80 percent below 1990 by 2050 will be consistent with the IPCC's analysis specifying the global emissions trajectory needed to stabilize atmospheric concentration (i.e., levels of 450 ppm of CO₂ or less is needed to reduce the likelihood of catastrophic global climate change) (CARB 2017).

Taking into consideration CARB's recommendation in the 2008 Scoping Plan, the 2011 CAP developed a 12 percent reduction target from 2005 baseline levels (546,548 MTCO₂e) by 2020 (646,947 MTCO₂e under the BAU scenario). The 2017 Scoping Plan Update recommends local targets of 6 MTCO₂e per capita by 2030 and 2 MTCO₂e in 2050. In addition, the statewide 2020 target is to reduce 2020 emissions to 1990 levels. Estimating the equivalent reduction needed from the 2012 baseline based on the State inventory, the City would need to reduce emissions 4 percent below 2012 levels by 2020 to be consistent with AB 32. Recognizing that anticipated State, federal, and local actions would achieve significant reductions by 2020, the City elected to set a more ambitious target for 2020. In summary, the City will aim to achieve the following reduction targets:

Taking legislative reductions into account, emissions are projected to decrease in the BAU forecast in 2020 to meet the State goals. Legislative actions are expected to reduce the BAU forecast in 2030; however, reductions in emissions in 2020 and 2030 are not, in and of themselves, enough to meet established targets.

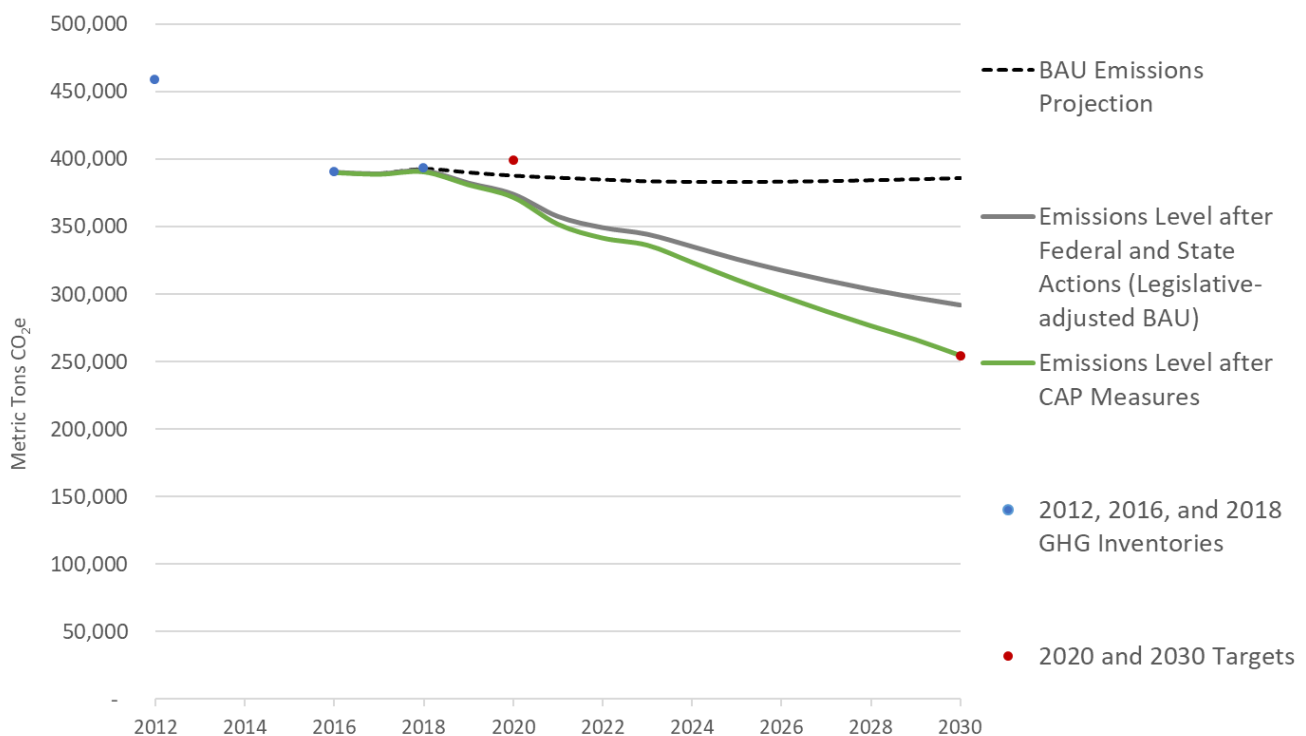
- 13 percent below 2012 levels by 2020; and
- 44 percent below 2012 levels by 2030.

To reach the short-term reduction goal of 13 percent below 2012 GHG emissions levels, the City will need to reduce emissions by 59,664 MTCO₂e to 399,292 MTCO₂e by 2020.

California's GHG reduction targets have been legislatively adopted for 2020 and 2030, while the 2050 goal is expressed in an executive order. In addition, CARB's 2017 Scoping Plan Update focuses on meeting the 2030 reduction target, as directed in SB 32. Therefore, the 2018 CAP aligns with the State in proposing actions and supporting measures to meet the 2030 target. As climate change science and policy continues to advance, the City will be able to apply new reductions toward meeting a long-term 2050 GHG emissions reduction goal in future CAP updates, as outlined in Chapter 4. Over the coming decades new innovations and technologies will likely become available that will enable further GHG

reductions. New methods may become available to quantify measures that are currently unquantifiable. Finally, new State and federal regulations may further reduce emissions in sectors currently addressed primarily by local actions and supporting measures.

To achieve the long-term GHG reductions, the City will need to reduce emissions by 201,941 MTCO₂e to 254,575 MTCO₂e (44 percent below 2012 levels) by 2030. The City achieves the 2020 target because of federal and State legislative measures; however, such GHG-reducing legislation alone is not sufficient to achieve the 2030 target. As described in Chapter 3, to meet the City's 2030 target, the City will need to implement local GHG reduction strategies. A detailed technical analysis of the City's emissions reduction targets and goals can be found in Appendix B. Figure 2-2 shows the City's BAU emissions and legislative-adjusted BAU forecasts alongside the City's GHG reduction targets over time.



Energy Policy Initiatives Center 2020

Figure 2-2: BAU and Legislative-Adjusted Forecasts and Targets



CHAPTER 3

Greenhouse Gas Reduction Strategies, Goals, and Actions

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This chapter outlines the strategies, goals, and specific actions that the City of Encinitas (City) will implement to achieve its greenhouse gas (GHG) reduction targets, as outlined in Chapter 2. Strategies, goals, and actions focus on locally-based programs, policies, and projects that will reduce GHG emissions in various categories as a complement to legislative actions taken by the federal and State governments.

Strategies, which represent the primary ways to achieve GHG reductions, are organized under six GHG emissions categories. Within each strategy are a series of goals, actions, and supporting measures that define the objectives, programs, policies, and projects the City will implement to reduce GHG emissions. These actions and measures mainly focus on community-scale reductions, but also include local government operations. Through partnerships with and among residents, businesses, agencies, and other organizations, these actions and measures will provide net benefits for everyone.

Emissions categories include:

- Electricity & Natural Gas
- Water
- On-Road Transportation
- Off-Road Transportation
- Solid Waste
- Carbon Sequestration

The 2018 Climate Action Plan (2018 CAP) accounts for existing plans, programs, and activities that the City has already undertaken to reduce emissions by acknowledging these efforts and, in some cases, building or expanding upon them. The 2011 CAP included 34 GHG reduction measures from the transportation, energy, solid waste, and water sectors designed to reduce emissions through the incorporation of renewable energy; increased energy, fuel, and water efficiency; parking maximums; zero-emission vehicle infrastructure; and more. The 2018 CAP encompasses and expands upon the goals of the 2011 CAP reduction measures by including measurable and quantifiable goals. The 2018 CAP has been prepared to be consistent with Section 15183.5 of the CEQA Guidelines. For more details on how proposed strategies and actions differ from the 2011 CAP, see Appendix C.

Many of the strategies and actions to reduce GHG emissions will also have important co-benefits, which are discussed in this chapter. Co-benefits are the additional beneficial effects that will result from implementation of strategies and actions. Climate change adaptation and building community resilience are important components of climate action planning, and this is discussed in further detail in Chapter 5.

Climate action planning is important because if community emissions in the City were to continue to grow under business-as-usual (BAU) practices and activities, the City's GHG emissions would meet and exceed the 2020 reduction target by approximately 50,000 metric tons of carbon dioxide equivalent (MTCO₂e), but would fall short of the 2030 target by 35,284 MTCO₂e. As described in Chapter 2, the City has established a 2020 GHG emissions reduction target (13 percent below 2012 levels) and a 2030 target (44 percent below 2012 levels) to reduce annual emissions levels. With the strategies proposed in the 2018 CAP, the City's GHG emissions will exceed 2020 and 2030 targets.

Under a business-as-usual (BAU) scenario, the City would meet its 2020 target, but would fall short of meeting the 2030 target by 35,284 MTCO₂e.

Table 3-1 below shows the GHG reductions attributable to the strategies included in the 2018 CAP. Table 3-2 demonstrates how the anticipated reductions will help the City meet its GHG reduction targets. Detailed calculations and description of the calculation methodologies are provided in Appendix A, B, and G.

Table 3-1 GHG Reductions from Proposed Reduction Strategies for 2020 and 2030 (MTCO_{2e})

Strategy	2020 ¹	2030 ²
Building Efficiency	941	675
Renewable Energy	434	20,935
Clean and Efficient Transportation	4,481	5,899
Water Efficiency	712	792
Zero Waste	2,830	9,216
Reduce Off-Road Equipment	128	142
Carbon Sequestration	5	66
GHG Avoided from All CAP Strategies	9,531	37,725
GHG Avoided from Federal and State Regulations	53,232	94,041
Total Reductions	62,764	131,765

Notes: Columns may not add to totals due to rounding.

MTCO_{2e} = Metric Tons of Carbon Dioxide Equivalent

¹Source: Appendix B, EPIC 2017.

²Source: Appendix G, EPIC 2020.

Table 3-2 Effect of Plan Actions on City of Encinitas Emissions and Target (MTCO_{2e})

Emissions	2020 ^{1,2}	2030 ²
BAU Emission Projection	474,712	386,341
Legislative Reductions	53,232	94,041
Legislative-Adjusted BAU Emissions Projection (BAU Projection – Legislative Reductions)	421,480	292,300
Baseline Emissions (2012)	459,000	459,000
City of Encinitas GHG Reduction Target (Percent below 2012)	13%	44%
Target Emissions	399,292	254,575
Reductions from 2018 CAP Actions	9,532	37,725
City of Encinitas Emissions with 2018 CAP (Legislative-Adjusted BAU – 2018 CAP Reductions)	396,236	254,575
Target Achieved?	YES	YES

Notes: Columns may not add to totals due to rounding.

MTCO_{2e} = Metric Tons of Carbon Dioxide Equivalent

¹Source: Appendix A and B, EPIC 2017.

²Source: Appendix G, EPIC 2020.

3.1 GHG Reduction Strategy Framework

The 2018 CAP actions were developed using a GHG reduction strategy framework that was based on a combination of factors. These include:

- The feasibility of the action to be implemented by the City.
- The need for greater reductions in categories with the most emissions (i.e., electricity and on-road transportation).
- Existing programs, policies, or projects that can be expanded or proposed policies yet to be adopted.
- Feedback from the community and other stakeholders (e.g., Environmental Commission and public workshops).
- Technological innovations.



The reduction strategy framework consists of emissions categories, strategies, goals, actions, and supporting measures, which are defined below:

Emissions Category	Source of GHG emissions, as defined by the City’s baseline assessment. Emissions categories include: Electricity & Natural Gas, Water, On-Road Transportation, Off-Road Transportation, Solid Waste, and Carbon Sequestration. Emissions categories, except for Carbon Sequestration, align with the GHG Emissions inventory outlined in Chapter 2. Carbon Sequestration is additionally included in this reduction strategy framework as a category by which to reduce overall emissions.
Strategy	High-level plans the City will implement to achieve GHG reductions in a specific emissions category. Each emissions category may have one or more associated strategies. The framework includes 7 overall strategies.
Goal	The general objective that the City will strive to achieve to address the defined strategy. Each strategy will have at least one or more goals.
Target Year	Year corresponding to the emissions targets set by the City and that are in line with State laws and guidelines. For the 2018 CAP, the City’s proposed target years include 2020 and 2030.
Performance Metric	Quantitative metric by which achievement of the specified goal will be measured. Each goal will have two performance metrics, one for each target year (i.e., 2020 and 2030).

GHG Reduction Potential	Estimated reduction in local greenhouse gas emissions if the performance metric is met. The reduction is presented in MTCO ₂ e.
CAP Measures	Programs, policies, or projects the City will implement that will cause a <i>direct</i> and <i>measurable</i> reduction in greenhouse gas emissions.
Supporting Measures	Programs, policies, or projects the City will implement that could not be quantified, but will have an indirect effect on greenhouse gas emissions reductions.

To help meet designated targets, the 2018 CAP proposes 20 measures and numerous supporting measures organized under 7 strategies and 6 emissions categories. The following sub-sections detail GHG reduction strategies under each emissions category. A description of the emissions category is followed by separate tables describing each strategy, its goal(s), performance metrics, GHG reduction potential, and any supporting measures. While many of the emission reductions of the CAP Measures can be quantified, others are difficult to quantify and are thus classified as “supporting measures.” Supporting measures cannot be quantifiable because of data limitation or lack of an available method to quantify emissions reductions; however, the combination of all CAP Measures and supporting measures contribute towards achieving 2020 and 2030 targets and are important to include.

Additional detail and calculations can be found in Appendix B. Chapter 4 further describes how CAP Measures will be implemented.

3.1.1 Electricity and Natural Gas

Electricity and natural gas consumption accounted for 36 percent of the City’s total emissions in 2012. Legislative reductions from State actions will reduce electricity and natural gas emissions by 45 percent. Emissions reductions from the Electricity and Natural Gas Category are divided into two strategies: Building Efficiency and Renewable Energy. The success of these strategies relies on coordination with local utilities and organizations, participation from the community, and administration of new or revised local policies and programs. All Electricity and Natural Gas strategies also serve as adaptation strategies by reducing overall energy demand and increasing the ability of the community and local economy to weather future change.



Strategy 1: Building Efficiency

The energy (electricity and natural gas) used in buildings accounts for the majority of GHG emissions in the Electricity and Natural Gas category. Although legislative reductions related to State actions will help reduce emissions associated with building energy, additional reductions can help to increase building efficiency in the City. Under this strategy emissions are reduced by requiring residential and commercial units to be more energy efficient, and by improving energy efficiency beyond State requirements. Implementation of the Building Efficiency Strategy would reduce the City's emissions by 941 MTCO₂e by 2020 and 675 MTCO₂e by 2030. Table 3-3 outlines the framework for this strategy.

Co-Benefits of Building Efficiency:

- Improved Air Quality
- Reduced Fossil Fuel Reliance
- Energy Savings
- Cost Savings
- Increased Renewable Energy

Table 3-3 Strategy 1: Building Efficiency

Goal 1.1: Reduce Building Energy Consumption		
CAP Measure BE-1: Adopt a Residential Energy Efficiency Ordinance		
Adopt an ordinance requiring all existing residential property owners conducting major renovations to implement energy efficiency retrofits.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Not applicable. Replaced by energy efficiency ordinance as part of 2020 Interim CAP Update.	-
2030	Retrofit 250 homes by 2030.	14
CAP Measure BE-2: Require Decarbonization of New Residential Buildings		
Adopt an ordinance requiring electrification of new residential buildings, including single family homes and low-rise multi-family homes.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Not applicable. Due to lack of cost-effectiveness, revised measure as part of 2020 interim CAP update.	-
2030	Complete 1,200 new low-rise residential electrification by 2030.	466
CAP Measure BE-3: Adopt Higher Energy Efficiency Standards for Commercial Buildings		
Evaluate adopting an ordinance requiring 1) all new commercial buildings, including commercial portion of mixed-use projects, and 2) commercial building additions of 1,000 square feet or greater or alterations with a permit value of at least \$200,000 to meet the 2019 California Green Building Standards Code Nonresidential Tier 1 Voluntary Measures.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Not applicable. Revised measure as part of 2020 interim CAP update.	-
2030	Reduce 1.4 million kWh electricity use and 5,000 therms natural gas use by 2030.	57
CAP Measure BE-4: Require Decarbonization of New Commercial Buildings		
Adopt a building ordinance that requires all new commercial buildings, including the commercial portion of mixed-use projects, to install electric conduit and wiring sufficient to operate electrical appliances and require electric appliances to be installed.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Not applicable. Due to lack of cost-effectiveness, revised measure as part of 2020 interim CAP update.	-
2030	Reduce energy use in commercial spaces (reduce 54,000 kWh and 500,000 therm)	97

Table 3-3 Strategy 1: Building Efficiency**Supporting Measures for Goal 1.1:**

- Facilitate homeowner and business owner financing of energy efficiency measures by expanding PACE financing options.
- Expand and implement a Green Building Incentive Program to promote energy retrofits at homes and businesses.
- Educate homeowners about the energy audit process and any applicable incentives and streamline the process of identifying energy auditing contractors.
- Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
- Promote pool pump conversions to variable speed pumps.
- Continue energy efficiency permit fee waiver program.
- Support the state's efforts to enact decarbonization legislation.
- Educate homeowners and businesses on decarbonization, building electrification, and electric appliance options.

Goal 1.2: Reduce Municipal Operation Energy Consumption**CAP Measure MBE-1: Continue Implementation of Energy Efficient Projects in Municipal Facilities**

Reduce municipal energy use below 2012 baseline energy use. Municipal facilities include the Civic Center, libraries, Community Center, fire stations, parking lots and more.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Reduce energy use (electricity and natural gas) by 7.5% in municipal facilities (not including street lights)	54
2030	Reduce energy use (electricity and natural gas) by 15% in municipal facilities (not including street lights)	40

Supporting Measures for Goal 1.2:

- Conduct audits to quantify energy use and to identify and quantify energy efficiency and conservation opportunities.
- Identify grants, rebate and incentive programs, and financing opportunities for municipal energy efficiency programs.
- Adopt a policy that new municipal buildings will be ZNE buildings.
- Convert City streetlights, traffic signals, and outdoor lighting to LED or other efficient lighting technology and monitor with energy management system.
- Implement the Environmentally Preferable Purchase Policy.
- Continue to track State legislation and lobby for change were proposals align with City goals and vision.

Notes:

CSE = Center for Sustainable Energy; kWh = kilowatt-hour; LED = low-emitting diode; MTCO_{2e} = metric tons of carbon dioxide equivalent; SDG&E = San Diego Gas & Electric; PACE = Property Assessed Clean Energy; ZNE = zero net energy

Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.

Strategy 2: Renewable Energy

Transition from fossil fuels to renewable energy for electricity generation will reduce emissions and provide a more sustainable source of electricity. Under this strategy, emissions are reduced by streamlining access to renewable energy; increasing the supply of renewable energy for residences, commercial, and municipal operations within the City; and increasing the amount of onsite renewable energy at existing and new residential and non-residential development. Implementation of Strategy 2 would reduce the City's emissions by 434 MTCO_{2e} by 2020 and 20,935 MTCO_{2e} by 2030. Table 3-4 outlines the framework for this strategy.

Co-Benefits of Renewable Energy:

- Improved Air Quality
- Improved Public Health
- Green Jobs
- Reduced Fossil Fuel Reliance
- Energy Savings
- Cost Savings
- Increased Renewable Energy

Table 3-4 Strategy 2: Renewable Energy**Goal 2.1: Achieve 100% Renewable Electricity Supply in Homes and Businesses****CAP Measure RE-1: Establish a Community Choice Energy Program¹**

Present to City Council for consideration a Community Choice Energy program that increases renewable electricity supply.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Launch a CCE Program with renewable electricity sources as a percentage of overall energy supplies equal to or greater than the current percentage of renewable electricity provided by SDG&E ¹ and 80% customer participation.	-
2030	100% renewable electricity supply and 80% customer participation.	19,465

CAP Measure RE-2: Require New Homes to install Solar Photovoltaic Systems²³

Require 1) New single-family homes to install at least 1.5 W solar per square feet (e.g., 2,000 sq. ft. home = 3 kW) or minimum 2 kW per home; 2) New multi-family homes to install at least 1 W solar per square feet (e.g., 1,000 sq. ft. home = 1 kW) or minimum 1 kW per unit, to install solar PV systems, unless the installation is impracticable due to poor solar resources.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Install 400 kW (0.4 MW) of solar photovoltaics on new homes.	141 ³
2030	Install 1,000 kW (1 MW) of solar photovoltaics on new homes.	614 ³

CAP Measure RE-3: Require Commercial Buildings to install Solar Photovoltaic Systems

Adopt an ordinance requiring installation of solar photovoltaic systems on 1) all new commercial buildings, including the commercial portion of mixed-use projects, 2) commercial building additions that increase total roof area by at least 2,000 sq. ft. or alterations with a permit value of at least \$1,000,000 that affect at least 75% of gross floor area, unless the installation is impracticable due to poor solar resources or other physical constraints, as approved Director of Development Services.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Not applicable. Measure revised as part of 2020 interim CAP update.	-
2030	Install 2.7 MW of solar photovoltaics on new and retrofitted commercial spaces.	989

Supporting Measures for Goal 2.1:

- Develop RFP and allocate funds for CCE Technical Feasibility Study.
- Expand and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating at homes and businesses.
- Facilitate homeowner and business owner financing of renewable energy systems by expanding PACE financing options.
- Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
- Consider the purchase of Renewable Energy Credits (RECs), if needed, to achieve to achieve 100% renewable electricity supply in 2030.

¹ The renewable electricity supply requirement would be compliant with the State's most current RPS target (at least 33% by December 31, 2020, 40% by December 31, 2024, 45% by December 31, 2027, and 50% by December 31, 2030 (SB 350, §399.15(b)(2)(B))) and would be equal to or exceed the year 2020 power mix of the existing utility provider SDG&E (which was 43% "Eligible Renewable" in 2016 and projected to be approximately 49% in 2021). Current Power Content Labels of utility providers showing the power mix is provided by the California Energy Commission, Utility Annual Power Content Labels (<http://www.energy.ca.gov/pcl/labels/>).

² In a mixed-use building that includes one type of use on top of another (e.g., residential above commercial), photovoltaic systems may be installed on the roof of the entire building to offset electricity usage from both land use types.

³ New California 2019 Building Energy Efficiency Standards went into effect on January 1, 2020, which require all newly constructed single-family homes, low-rise multi-family homes, and detached accessory dwelling units (ADUs) to have PV systems installed, unless the building receives an exception. Therefore, RE-2 GHG emissions reductions related to RE-2 are now quantified as part of state legislative actions in Section 2.3.2 of the 2018 CAP.

Goal 2.2: Increase Renewable Electricity Supply in Municipal Operations**CAP Measure MRE-1: Supply Municipal Facilities with Onsite Renewable Energy**

Supply municipal facilities with onsite renewable energy to achieve "Net Zero Electricity" municipal operations. Implement "City of Encinitas Solar Assessment Report" by installing 1.3 MW of solar systems at city facilities.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	50% of City facility electricity is supplied by onsite renewable energy generation (0.65 MW equivalent).	233
2030	100% of City facility electricity is supplied by onsite renewable energy generation (1.3 MW equivalent).	481

Supporting Measures for Goal 2.2:

- Conduct audits to quantify energy use and to identify and quantify energy efficiency and conservations opportunities.
- Identify grants, rebate and incentive programs, and financing opportunities for municipal energy efficiency and renewable energy programs.
- Implement the Environmentally Preferable Purchase Policy.

Notes:

CCE = Community Choice Energy; CSE = Center for Sustainable Energy; kWh = kilowatt; MTCO₂e = metric tons of carbon dioxide equivalent; MW = megawatt; RFP = Request for Proposal; SDG&E = San Diego Gas & Electric; PACE = Property Assessed Clean Energy; W = watt
Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.

3.1.2 Water

GHG emissions are produced through the energy used to pump, transport, and treat water and wastewater. Although water and wastewater-related GHG emissions only accounted for three percent of the City's emissions in 2012, water conservation is needed to address serious periodic drought issues that frequently affect the City and the State. As discussed in Chapter 5, drought conditions could increase in frequency and severity because of climate change over the long-term. All water strategies also serve as adaptation strategies by preserving water quality and encouraging water conservation.



Strategy 3: Water Efficiency

Water and wastewater-related actions and supporting measures under this strategy will reduce both the strain on water supplies and GHG emissions from pumping and treatment activities. Under Proposition 218, local jurisdictions must follow cost of service principles when setting water rates. As a result, the San Dieguito Water District (SDWD) can only charge customers what it costs SDWD to serve them with water. For this reason, water rates cannot be directly used to encourage water conservation. However, to account for the increased costs associated with supplying and producing water, water rates can be tiered, to make higher levels of water use more expensive. CAP Measure WE-1 takes into consideration the indirect effects increased water rates could have on water consumption. With increased water rates, water consumption, and thus GHG emissions, will likely decrease. Furthermore, the supporting measures proposed will reduce emissions primarily through water conservation in new and existing facilities, providing incentives to reduce indoor and outdoor water consumption, and providing education and outreach on water efficiency. Emissions reductions from Water Efficiency Strategy rely on successful coordination with and participation from SDWD, City residents, and businesses. Implementation of Strategy 3 would

Co-Benefits of Water Efficiency:

- Water Supply and Conservation
- Improved Public Health
- Energy Savings
- Cost Savings
- Increased Resiliency

reduce the City’s emissions by 712 and 792 MTCO₂e by 2020 and 2030, respectively. Table 3-5 outlines the framework for this strategy.

Table 3-5 Strategy 3: Water Efficiency

Goal 3.1: Reduce City-wide Potable Water Consumption

CAP Measure WE-1: Regularly Conduct Water Rate Studies and Implement Approved Water Rates

SDWD and OMWD complete regular water rate studies and adopt modified water rates as approved by Board of Directors.

Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Save 5 gallons per capita per day (GPCD) water use (258 million gallons of water saved).	712
2030	Reduce water use by 2,400 acre-feet (672 million gallons of water saved).	795

Supporting Measures for Goal 3.1:

- Facilitate homeowner and business owner financing of water efficiency measures by expanding PACE financing options.
- Educate homeowners and businesses about water efficiency rebate and incentive programs offered to SDWD and OMWD customers.
- Evaluate key challenges that were identified in the 2016 SDWD Potable Reuse Feasibility Study.
- Conduct audits and retrofit all municipal facilities with water-efficient features to reduce potable water use at municipal facilities.
- Convert all current municipal landscape adjacent to recycled water pipelines to recycled water. Look for opportunities to work with the San Elijo Joint Powers Authority to extend recycled water pipelines to additional municipal facilities, when economically viable.
- Evaluate reducing the landscape area thresholds for projects to meet regulations outlined in the City’s existing Water Efficient Landscape Ordinance (EMC Chapter 23.26). This ordinance promotes water conservation by requiring new and redeveloped landscapes to use water efficient plants and technology.
- Implement and enforce the Water Supply Shortage Response Program ordinances (administered by SDWD and OMWD) which require citywide water conservation during drought conditions.
- The City’s Clean Water Program will continue to be actively involved in the Carlsbad Watershed Water Quality Improvement Plan development and implementation.
- Implement a Low Impact Development Outreach and Incentive Program for residents and businesses.
- Work with developers to implement Low Impact Development and other stormwater features on new and redevelopment projects.
- Source water from least-cost sources first, whenever possible.

Notes:
GPCD = gallons per person per day; SDWD = San Dieguito Water District; MTCO₂e = metric tons of carbon dioxide equivalent; OMWD = Olivenhain Municipal Water District; PACE = Property Assessed Clean Energy
Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.

3.1.3 On-Road Transportation

Internal combustion from on-road transportation is the largest contributor to the City’s GHG emissions. Emissions from on-road transportation sources accounted for 54 percent of the City’s total emissions in 2012. Legislative reductions, mainly from improvements in State and federal vehicle fuel efficiency standards, will contribute to reducing transportation emissions. While these legislative reductions apply to the fuel efficiency of vehicle operations, strategies that affect the frequency or distance of vehicle travel are within local or regional control and can be addressed in a local CAP.



Strategy 4: Clean and Efficient Transportation

Under this strategy, emissions are reduced by reducing vehicle trips through consolidation of vehicle trips and non-motorized solutions, encouraging the use of electric and alternative fuel vehicles, and reducing vehicles miles traveled (VMT) through smarter land use planning. Emissions reductions from this strategy rely on coordination with, and participation from local and regional transportation and planning agencies, residents, and businesses. Implementation of the Clean and Efficient Strategy would reduce the City's emissions by 4,481 and 5,900 MTCO_{2e} by 2020 and 2030, respectively. Table 3-6 outlines the framework for this strategy.

Co-Benefits of Clean and Efficient Transportation:

- Improved Air Quality
- Reduced Fossil Fuel Reliance
- Improved Public Health
- Improved Mobility
- Cost Savings

Table 3-6 Strategy 4: Clean and Efficient Transportation

Goal 4.1: Reduce Vehicle Miles Traveled

CAP Measure CET-1: Complete and Implement the Citywide Active Transportation Plan

Implement the bicycle and pedestrian projects in the Active Transportation Plan (ATP). In concert with the Housing Element housing site build-out, ATP projects are estimated to lead to a 9% shift in bicycle mode share and 8% shift in walk mode share within the vicinity of ATP projects.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Adopt the ATP.	-
2030	Install the bicycle and pedestrian projects identified in the ATP.	254

CAP Measure CET-2: Implement a Local Shuttle System

Implement service routes recommended in Encinitas Transit Feasibility Study, using CNG buses for these routes, or alternate shuttle system, as approved by City Council:

- By 2020: Express Services to educational facilities - one route to Mira Costa College and one route to La Costa Canyon High School.
- By 2025: One route to Encinitas Circulator and one to Encinitas COASTER connection.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Reduce 365,000 VMT.	130
2030	Reduce 875,000 VMT.	178

Supporting Measures for Goal 4.1:

- Develop and implement a complete streets policy.
- Develop program to support car sharing and bike sharing for the community.⁴
- Complete Safe Routes to Schools projects to decrease need to drive students to school.
- Coordinate with regional transit authorities and local school districts to improve student busing and public transit options.
- Support SANDAG iCommute Program for guaranteed ride home for the community.
- Develop and implement a City Bike Rack Program.
- Develop and implement a program to incentivize City employees commuting to work by bike or other modes of alternative transport as a model for other local employers.
- Adopt the National Association of City Transportation Officials *Urban Bikeway Design Guide* and utilize as a policy in the Capital Improvement Program (CIP) roadway projects.

⁴ A regional Bikeshare program for the North County coastal area is currently in development. The Bikeshare program is expected to increase the number of trips taken by bike and reduce car trips.

Table 3-6 Strategy 4: Clean and Efficient Transportation

- Update the City's Housing Element⁵ and implement and enforce the City's existing specific plans (Downtown Encinitas Specific Plan and the North 101 Corridor Specific Plan) to reduce Vehicle Miles Traveled and encourage dense, infill development.
- Develop building regulations that support bike parking and the installation of bike racks, including covered bike parking/storage and allowing bike parking spaces to contribute to a development's overall parking requirement.
- Install traffic infrastructure enhancements that support biking and walking. Could include bike sensors and associated street markings to indicate the location of the sensor, pedestrian detectors at intersection, cross walks, traffic bollards, etc.
- Implement a monitoring program for assessing biking, walking and transit ridership in the City to determine the baseline level of travel and facilitate the development of appropriate mode shift targets for the City.
- Complete the Modal Alternatives Plan to support this design and installation of the bike and pedestrian projects identified in the Active Transportation Plan.

Goal 4.2: Reduce On-road Fuel Use**CAP Measure CET-3: Improve Traffic Flow**

Improve traffic flow by retiming traffic signals and installing roundabout at intersections in the City.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Retime 60 traffic signals and install 3 roundabouts.	3,671
2030	Install 4 roundabouts.	1,241

Supporting Measures for Goal 4.2:

- Identify rebate and incentive programs and financing opportunities for installing roundabouts.
- Update the City's Circulation Element to support improved traffic flow.

Goal 4.3: Increase Use of Alternative Fuels**CAP Measure CET-4: Require Residential Electric Vehicle Charging Stations**

Starting in 2018, require new residential units to install EVCS equipment. For 1) Single Family: Install complete 40-Amp electrical circuit (EV Ready) 2) Multi-Family: Install EVCS equipment at 15% of the total number of parking spaces.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Install 65 electric vehicle charging stations.	185
2030	Install 370 electric vehicle charging stations.	260

CAP Measure CET-5: Require Commercial Electric Vehicle Charging Stations

Starting in 2018, require installation of EVCS at 8% of the total number of parking spaces. For 1) all new commercial buildings, including the commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with square footage larger than 10,000 sq. ft.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Install 150 electric vehicle charging stations.	440
2030	Install 490 electric vehicle charging stations.	3,582

Supporting Measures for Goal 4.3:

- Expand and implement a Green Building Incentive Program to increase electric vehicle charging at home and businesses.
- Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community.
- Work with SDG&E to explore projects through their Power Your Drive Program.
- Develop and implement EV charging plan for municipal facilities.

⁵ The 5th cycle Housing Element was adopted by City Council on March 27, 2019. The updated Housing Element promotes higher density, infill development for low income housing throughout City at specific locations. The 5th cycle Housing Element will add 1,504 new affordable housing units throughout the City. Several infill development sites were selected as locations for the increased housing and many are served by public transportation. Up-zoning to increase density is a component of the updated Housing Element. The Downtown Encinitas and North 101 Corridor Specific Plans also encourage denser development opportunities, including allowances for mixed use. These more densely developed areas can support greater usage of alternative transportation modes, including biking, walking and transit. The City's NCTD Coaster station is located within downtown Encinitas and one of the most popular cycling routes in the county is located along North Coast Highway 101.

Table 3-6 Strategy 4: Clean and Efficient Transportation

- Pursue partnerships with school districts and NCTD to explore the use of electric busing or public transit busing for schools.
- Implement a wayfinding program with signage and information systems to facilitate walking, biking, and efficient driving and parking.
- Implement educational activities to raise awareness about EVs among residents and businesses.
- Develop and implement a program to incentivize City employees commuting to work by Electric Vehicle or other modes of alternative transport as a model for other local employers.

CAP Measure MCET-1: Transition to Zero Emission Vehicle (ZEV) Municipal Fleet

Develop a municipal fleet replacement plan to 1) convert gasoline-fueled cars and light-duty trucks to Zero Emission Vehicles, including all-electric vehicles or other ZEV technology by 2030. 2) convert to renewable diesel for all diesel-fueled heavy-duty trucks by 2020.⁶

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Reduce City fleet fossil fuel use (gasoline and diesel) by 10%.	55
2030	Reduce City fleet fossil fuel use (diesel) by 30% and convert gasoline-fueled cars and light duty trucks to ZEV.	384

CAP Measure MCET-2: Adopt a Municipal Employee Telecommute Policy

Develop a policy for City Council consideration to facilitate telecommuting by City employees, based on job function, with approval from supervisor and human resources.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Not applicable, due to timing of 2020 interim CAP update.	-
2030	Avoid 170,000 miles of commuting from municipal employees.	50 MTCO _{2e}

Supporting Measures for Goal 4.3:

- Install EV charging stations at municipal facilities.
- Develop a City vehicle fleet conversion plan and identify funding to support conversion of fleet vehicles.
- Expand the City employee alternative commute program to include incentives to commute by bicycle, walking, carpooling, or electric vehicle, as approved by City Council.

Notes:

CNG = Compressed Natural Gas; electric vehicle = E; EVCS = electric vehicle charging stations; MTCO_{2e} = metric tons of carbon dioxide equivalent; SDG&E = San Diego Gas & Electric; VMT = vehicle miles traveled

Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.

3.1.4 Off-Road Transportation

Off-road transportation accounted for 2 percent of the City's total emissions in 2012. Transitioning from fossil-fuel based to renewable or electric off-road equipment is a key strategy for reducing emissions.

Strategy 5: Reduce Off-Road Equipment

Under this strategy, emissions are reduced by eliminating the use of two-stroke engine leaf blowers, which are known to emit a number of air pollutants. Because a percentage of the fuel engine fails to undergo complete combustion, the engine produces GHG emissions. Emissions reductions from this strategy relies on coordination with the City's Environmental Commission as well as public outreach and education on alternatives to gas-powered leaf-blowing

Co-Benefits of Off-Road Equipment Reduction:

- Improved Public Health
- Improved Air Quality

⁶ At the time that commuter mode share measures are calculated and included in the CAP, as described in CET-1, ZEV options for heavy duty fleet vehicles will also be evaluated and a revised target for heavy duty vehicles will be consider based on any advances in ZEV technology.

technologies. Implementation of Reduce Off-Road Equipment Strategy would reduce the City’s emissions by 128 MTCO₂e by 2020 and 142 MTCO₂e by 2030. Table 3-7 outlines the framework for this strategy.

Table 3-7 Strategy 5: Reduce Off-Road Equipment		
Goal 5.1: Reduce Off-Road Fuel Use		
CAP Measure OR-1: Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers		
Starting in 2018, prohibit 2-stroke leaf blowers and implement the phase-out of leaf blower emissions.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	Reduce all emissions from 2-stroke leaf blowers use.	128
2030	Reduce all emissions from 2-stroke leaf blowers use.	142
Supporting Measures for Goal 5.1: <ul style="list-style-type: none">Evaluate the use of alternative fueled landscaping equipment to reduce emissions.Educate home and business owners about alternatives to gas-powered leaf-blowing technologies.		
Notes: MTCO ₂ e = metric tons of carbon dioxide equivalent Source: EPIC 2017.		

3.1.5 Solid Waste

The solid waste category accounted for approximately 5 percent of the City’s total emissions in 2012. The Zero Waste Strategy aims to reduce emission through diverting solid waste from landfills. Solid waste disposal in a landfill generates emissions of GHGs through the anaerobic decomposition of organic products. To reduce these emissions, methane-generating organic material must be diverted away from landfills where they can properly decompose. Solid waste emissions reductions depend on expansion of County waste reduction, recycling, and composting programs; and participation from City residents and businesses to reduce waste and increase recycling.



Source: Solana Center for Environmental Innovation

Strategy 6: Zero Waste

Unlike the transportation, electricity, and natural gas categories, the City has greater jurisdiction over the handling of solid waste generated by the community. This strategy focuses on diverting a greater percentage of waste from landfills, through such method as composting and increased recycling. This strategy will also reduce waste in landfills, which will reduce costs to the City and reduce local odor impacts. Implementation of Strategy 6 would reduce the City’s emissions by 2,830 MTCO₂e by 2020 and 9,216 MTCO₂e by 2030. Table 3-8 outlines the framework for this strategy.

Co-Benefits of Zero Waste:

- Improved Air Quality
- Improved Water Quality
- Improved Public Health
- Cost Savings

Table 3-8 Strategy 6: Zero Waste

Goal 6.1: Divert Solid Waste**CAP Measure ZW-1: Implement a Zero Waste Program**

Implement a Zero Waste Program to reduce waste disposal from residents and businesses in the community.

Target Year	Performance Metric	GHG Reduction Potential (MTCO _{2e})
2020	Divert 65% of total solid waste generated (equivalent to 5.3 pounds per capita per day waste disposal).	2,830
2030	Divert 80% of total solid waste generated (equivalent to 3 pounds per capita per day waste disposal).	9,216

Supporting Measures for Goal 6.1:

- Implement an Organic Waste Recycling Program, including adherence to SB 1383 regulations, through the following measures:
 - Support regional efforts to plan for and develop residential and commercial food scrap composting programs.
 - Facilitate the establishment of fully-permitted community appropriate compost facilities in the City.
 - Continue to support at-home management of food waste through educational workshops and subsidies of compost bins and worm bins.
 - Continue to support Zero Waste programs at local schools.
 - Provide free audits of restaurants and grocery stores to reduce waste generation.
 - Develop City Hall waste audits and consider pilot composting project based on audit results.
 - Establish an edible food recovery program.
 - Provide outreach and education to generators.
- Develop education -materials for textile recycling.
- Evaluate and expand existing recycling requirements at City permitted events and activities.
- Expand outreach and education on the City's C&D Ordinance that has a lower threshold for covered projects.
- Support product stewardship and extended producer responsibility initiatives.
- Transition to an online permitting system to eliminate paper waste from the printing of permit applications and associated development project plans.

Notes:

C&D = Construction and Demolition; MTCO_{2e} = metric tons of carbon dioxide equivalent

Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.

3.1.6 Carbon Sequestration

Carbon sequestration refers to the process of removing atmospheric carbon dioxide (CO₂) through artificial or natural processes and occurs daily through the natural respiration of vegetation and trees. Carbon sequestration potential is lost when natural carbon sinks (e.g., trees) are cut down or removed. Conversely, a community can enhance or improve its carbon sequestration potential by increasing the volume and rate of planting trees and nurturing an urban canopy.

Co-Benefits of Carbon Sequestration:

- Improved Air Quality
- Improved Water Quality
- Improved Biological Resources

Strategy 7: Carbon Sequestration

As part of the natural carbon cycle, photosynthesis in plants takes CO₂ in the atmosphere and converts it into oxygen and carbon-based plant matter, storing the carbon captured from the atmosphere. Trees are significant sources of carbon storage and sequestration because of their size and longevity and provide essential habitat for local fauna. The most recent urban tree canopy assessment in San Diego region, based on high-resolution Light Detection and Ranging (LiDAR), shows the City has approximately 22% existing urban tree canopy.⁷ This strategy focuses on the preservation and expansion of tree growth in the City to increase the amount of carbon sequestered in hopes of offsetting CO₂ emissions generated by other sources to the extent feasible. Increased carbon sequestration and new tree plantings will also improve air quality through the capture of air pollutants, water quality through reduced erosion, biological resources by providing additional habitat and improved water quality, and community and public health through the provision of shade and positive impacts on mental health. Implementation of the Urban Forest Strategy would reduce the City's emissions by 5 MTCO₂e by 2020 and 66 MTCO₂e by 2030. Table 3-9 outlines the framework for this strategy.



Table 3-9 Strategy 7: Carbon Sequestration		
Goal 7.1: Increase Urban Tree Cover		
CAP Measure CS-1: Develop and Implement an Urban Tree Planting Program		
Starting in 2018, develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs, to promote increased carbon sequestration by trees within the community.		
Target Year	Performance Metric	GHG Reduction Potential (MTCO ₂ e)
2020	150 net new trees planted.	5
2030	Plant 100 net new trees annually for a total of 1,150 net new trees planted, increasing the tree canopy coverage from 22 to 22.32 percent, an increase in overall tree canopy of 0.32 percent.	66
Supporting Measures for Goal 7.1:		
<ul style="list-style-type: none">Continue turf management practices which specify the top-dressing of compost to increase carbon sequestration at City parks.Partner with schools to develop programs to educate students about planting trees.The City will continue to encourage developers to avoid the removal of any mature trees when a property is developed or redeveloped. If the removal of mature trees is unavoidable, trees are required to be replaced at a 1:1 ratio.When new parking lots are part of a development, trees are required to be planted at a ratio of one tree for every 5 parking spaces.Present to Council for consideration an ordinance to require and/or incentivize additional tree planting on private property throughout the city.The City will incentivize tree planting on private property by giving away tree seedlings during Arbor Day events.Supports regional LiDAR imagery data collection and analyze future LiDAR data to determine the overall increase in tree canopy as compared to the City CAP goals and targets.		
Notes: MTCO ₂ e = metric tons of carbon dioxide equivalent Source: Appendix B, EPIC 2017. Appendix G, EPIC 2020.		

⁷ The assessment was done in 2014 for all urban areas in the San Diego County using method developed by University of Vermont and USDA Forest Service. https://www.sandiego.gov/sites/default/files/san_diego_tree_canopy_assessment_05oct2016.pdf

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CHAPTER 4

Implementation and Monitoring

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This chapter outlines how the City of Encinitas (City) will implement and monitor the 2018 Climate Action Plan (2018 CAP) strategies, CAP Measures, and supporting measures over time to reduce greenhouse gases (GHGs). To achieve the GHG emissions reductions described in Chapter 3, actions should also be continuously assessed and monitored to ensure that: 1) the actions are effective; 2) the 2018 CAP is on track to achieve GHG reduction targets; and 3) desired community outcomes are met.

A separate and detailed Implementation Plan was prepared in conjunction with the final draft of the 2018 CAP. The Final CAP, CEQA document, and the standalone Implementation Plan will be presented to City Council concurrently. The more detailed Implementation Plan identifies key costs to the City including staffing needs, budget, and funding sources. It also includes a timeline for implementation of each GHG reduction action and supporting measure. All actions and supporting measures requiring significant funding will be brought to City Council for consideration and approval, either through the City's standard budget process or as an off-cycle budget request. This chapter provides a brief overview of the range of implementation needs and considerations for the 2018 CAP.

To adequately prepare an implementation strategy, this chapter assigns implementation timelines, staffing needs, funding needs, and relative cost where available. In terms of implementation timelines, actions and supporting measures were categorized into the following:

- Ongoing: already occurring or to occur in perpetuity.
- Short-term: within the next five years.
- Mid-term: within the next 10 years.
- Long-term: to occur beyond 10 years.

Specific timelines for action implementation will be delineated in the Implementation Plan. The cost to the City associated with each action and supporting measure was given values of low, medium, or high based on the anticipated level of resources, staffing, and time required to implement each action and/or supporting measure. Similarly, certain actions and measures may have associated costs for the community upfront that may be partially or wholly offset through increased efficiencies. Further, success of the 2018 CAP will require capital improvements, investments, and increased operations and maintenance costs. Definitions of the low, medium, and high descriptors are shown in the table below.

Relative Cost	Description
Low	Assumes that less than one full-time-equivalent employee and/or financing less than \$20,000 would be required to oversee implementation, and that sufficient incentives, subsidies, or rebates would be available to nearly offset the upfront cost of implementation to individuals or businesses
Medium	Assumes at least one full time equivalent employee, operational and maintenance costs and/or capital improvement financing between \$20,000 and \$100,000 would be required to construct new permanent facilities, and that private businesses or individuals would incur short-term costs of improvements, infrastructure, or employee training
High	Assumes need for more than one full time equivalent employees, operational and maintenance costs and/or capital improvement financing of \$100,000 or more would be required to construct new permanent facilities, and that private businesses or individuals would incur short-term and long-term costs of improvements, infrastructure, or employee training

4.1 Implementation Strategy

The recommended emission reduction actions and supporting measures were evaluated qualitatively to assess the cost, timeline, administrative and staffing needs, and responsible parties required for implementation. The City will incur costs to implement the actions and supporting measures proposed in the 2018 CAP. These include initial start-up, ongoing administration, and enforcement costs. While some actions and measures will only require funding from public entities, others will result in increased costs for businesses, contractors, and residents. However, most actions and measures provide substantial cost-savings in the long-term (e.g., improved energy efficiency will reduce energy costs over time). The City will be diligent in seeking cost-effective implementation and strategic funding opportunities while using partnerships to share the cost. Table 4-1 provides a summary of the relevant parties and responsible agencies, timeline, approximate costs to the City and community, and potential funding sources for implementation of each GHG reduction action and supporting measures.

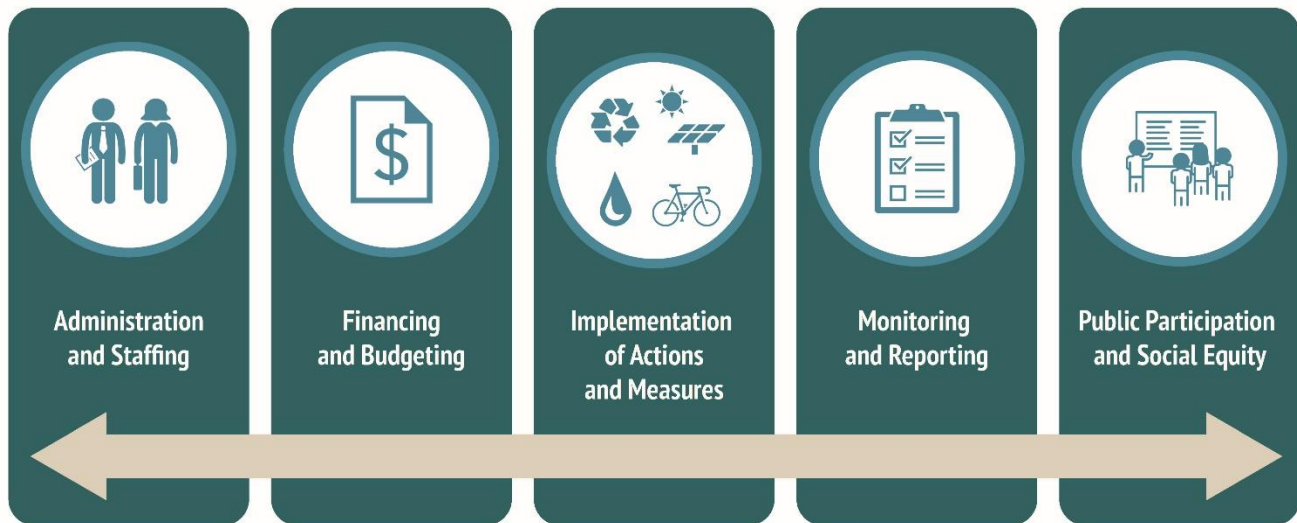
Proper implementation and tracking of the 2018 CAP allows City Staff, the Climate Action Working Group, City Council, and the public to monitor the effectiveness of each measure as well as the overall CAP.

A separate and detailed Implementation Plan was prepared in conjunction with the final draft of the 2018 CAP. The Final CAP, CEQA document, and the standalone Implementation Plan will be presented to City Council concurrently. The more detailed Implementation Plan identifies key costs to the City including staffing needs, budget, and funding sources. It also includes a timeline for implementation of each GHG reduction action and supporting measure. All actions and supporting measures requiring significant funding will be brought to City Council for consideration and approval either through the City's standard budget process or as an off-cycle budget request.

CAP Administration

The City will establish a permanent CAP Program Administrator position, or similar position, to ensure City Actions and Supporting Measures are implemented effectively and on time. The CAP Program Administrator will lead the overall implementation of the CAP and play a key role in implementing some of the most critical actions and supporting measures. The CAP Program Administrator will also be responsible for monitoring and reporting progress towards meeting 2018 CAP goals and emissions targets. Implementation of the 2018 CAP will be facilitated by appointed staff leads within various departments (see Table 4-1) and these staff leads would comprise the staff level CAP Workgroup. The CAP Program Administrator will manage the CAP Workgroup, convening and managing regular meetings to facilitate coordination of CAP implementation among the various City departments. The CAP Program Administrator will also seek regional funding, grant funding and other support such as the acquisition of a CivicSpark Fellow to assist with CAP implementation, monitoring and update. CivicSpark is an AmeriCorps program administered by the Local Government Commission to support local governments in addressing climate change.

If a project can demonstrate consistency with the land use projections and applicable GHG reduction measures in the CAP, the level of environmental review for the project required under CEQA with respect to GHG emissions can be considerably reduced.



KEY COMPONENTS OF IMPLEMENTING THE ENCINITAS CLIMATE ACTION PLAN

Social Equity

Incorporating equity into implementation of the CAP will be key to a successful outcome. Equity would ensure just distribution of the benefits of climate protection efforts and would help alleviate unequal impacts created by climate change. Social equity is a broad subject that transcends the CAP and intersects with multiple facets of City operations. However, the CAP presents an opportunity to begin addressing climate equity and laying the foundation for further action by the City. The City intends to address social equity in a holistic manner through its General Plan.

The City currently manages various programs to address equity in planning. The City of Encinitas Housing Authority operates a Section 8 Rental Assistance program for very-low income families. The City of Encinitas also receives an annual federal grant for the Community Development Block Grant Program (CDBG) program. Funds for the CDBG program are provided for affordable housing and community development activities within communities. The City also has an Inclusionary Housing requirement, whereby, developments of 10 or more units must provide affordable housing or pay an in-lieu fee to be used for affordable housing in the City.

The City will continue to incorporate equity considerations into implementation of the CAP. Local actions such as the Community Choice Energy (CCE) program and residential and commercial photovoltaic programs would create and promote jobs for the local workforce. The City will provide climate action related resources and knowledge-sharing opportunities for small-business owners at workshops and outreach events. The City will also consider low-income areas when locating and installing electric vehicle (EV) charging stations. Needs of underserved communities, such as low-income and seniors, would be considered when siting local transit shuttle routes and stops. Active transportation-related actions would be implemented to provide benefits to low-income populations, students, children, and other groups that do not have access to other transportation choices. The City is a participant in the North Coast Energy Action Collaborative, which supports energy savings for local businesses, including small businesses. The City would also partner with schools and local businesses to promote climate action. The City will also evaluate opportunities to install energy efficiency upgrades, photovoltaic systems, and EV charging stations at City-owned low-income housing. The City will actively prioritize actions and measures that include consideration of social equity. In preparing a holistic approach to equity, the City will develop tracking and reporting metrics to determine progress and success.

Green Jobs Creation

According to the Bureau of Labor Statistics, green jobs are defined as the following:

- A. Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources.
- B. Jobs in which workers' duties involve making their establishment's production processes more environmentally friendly or use fewer natural resources.

To provide support for the creation of green jobs within the City, the following measures will be implemented as part of the 2018 CAP:

1. The City's Economic Development effort, which serves to support local business development, will support the creation of green jobs through targeted workshops, customer service programs, funding of mainstreet and chamber associations and services offered via a business ombudsperson. In addition to green jobs, the CAP will support the "greening of jobs" by reducing the environmental impact of businesses associated with transportation, water use, energy use and solid waste generation.
2. The City will develop a Green Business Program for local businesses and restaurants. The program will include minimum participation requirements, awards for high achieving green businesses, the promotion of green jobs, and encouragement of local businesses to work on climate-related projects and programs through press releases, workshops, incentive programs, and social and other media outreach.
3. The City will facilitate the creation of green jobs through the promotion and support of the City's green business corridor, called the "[E³ Cluster](#)", which includes the Leichtag Foundation, the San Diego Botanic Garden, and the Encinitas Union School District Farm Laboratory. As the E³ Cluster develops, it will serve as a direct source of a significant number of additional green jobs within the City as well as promote and support other businesses and organizations to add green jobs throughout the City.
4. The City will track performance goals for green jobs and green businesses through the City's business license tracking system and report on green jobs and green businesses as part of the regular CAP monitoring report.
5. The City will provide efficiency and renewable energy training for the City employees responsible for the management of City facilities.
6. The City will ensure that all climate action-related work done through City programs comply with the California Statewide Prevailing Wage Ordinance, where applicable.
7. The City recently completed an update to its Housing Element to be compliant with State law. The updated Housing Element includes housing options for all facets of the City's workforce and will create a more sustainable live/work community. This more complete community will facilitate a reduction in vehicle miles traveled and encourage the use of greener transportation modes like biking, walking and public transit. These new residents could seek local employment and support the city's transition to a workforce made up of more local and green jobs.

Table 4-1 Implementation Strategy Matrix

Number	CAP Measure	Reductions in 2020 (MTCO _{2e})	Reductions in 2030 (MTCO _{2e})	Implementation Timeline	Cost		City Department/Division Responsibility
					City ⁸	Community	
BE-1	Adopt a Residential Energy Efficiency Ordinance	47	14	Short-Term, then Ongoing	Low	Low	Development Services/Planning
BE-2	Require Decarbonization of New Residential Buildings	130	466	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
BE-3	Adopt Higher Energy Efficiency Standards for Commercial Buildings	98	57	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
BE-4	Require Decarbonization of New Commercial Buildings	612	97	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
MBE-1	Continue Implementation of Energy Efficient Projects in Municipal Facilities	54	40	Mid-Term	Medium	Low	Public Works/Facilities
RE-1	Establish a Community Choice Energy Program	0 ³	19,465	Mid-Term	High	Low	City Manager/Environmental Services
RE-2	Require New Homes to install Solar Photovoltaic Systems	141	N/A: Quantified as part of legislatively-adjusted BAU projection	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
RE-3	Require Commercial Buildings to install Solar Photovoltaic Systems	59	989	Short-Term, then Ongoing	Low	Medium	Development Services/ Planning
MRE-1	Supply Municipal Facilities with Onsite Renewable Energy	233	481	Short-Term	Low	Low	Public Works/Facilities
WE-1	Complete Water Rate Study and Implement New Water Rates	712	795	Ongoing	Medium	Low	SDWD & OMWD

⁸ Administrative costs to the City to implement the CAP will be quantified in the Implementation Plan.³ Reductions for CCE are assumed to be zero for 2020 to allow time for program development and implementation.

Table 4-1 Implementation Strategy Matrix

Number	CAP Measure	Reductions in 2020 (MTCO _{2e})	Reductions in 2030 (MTCO _{2e})	Implementation Timeline	Cost		City Department/Division Responsibility
					City ⁸	Community	
CET-1	Complete and Implement the Citywide Active Transportation Plan	0 ⁹	254	Long-Term	High	Low	Development Services/Planning & Development Services/Engineering
CET-2	Implement a Local Shuttle System	1130	178	Mid-Term, then Ongoing	High	Low	City Manager/Environmental Services
CET-3	Improve Traffic Flow	3,671	1,241	Mid-Term	High	Low	Development Services/Engineering
CET-4	Require Residential Electric Vehicle Charging Stations	185	260	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
CET-5	Require Commercial Electric Vehicle Charging Stations	440	3,582	Short-Term, then Ongoing	Low	Medium	Development Services/Planning
MCET-1	Transition to Zero Emission Vehicle (ZEV) Municipal Fleet	55	384	Short-Term, then Ongoing	Low	Low	Public Works/Fleet
MCET-2	Adopt a Municipal Employee Telecommute Policy	0 ¹⁰	50	Short-Term, then Ongoing	Low	Low	City Manager/Human Resources
OR-1	Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers	128	142	Short-Term, then Ongoing	Low	Low	Development Services/Engineering
ZW-1	Implement a Zero Waste Program	2,830	9,216	Mid-Term	High	Low	City Manager/Environmental Services
CS-1	Develop and Implement an Urban Tree-Planting Program	5	66	Short-Term, then Ongoing	Medium	Low	Public Works/Streets & Parks/Parks, Beaches, Trails

Notes: MTCO_{2e} = metric tons of carbon dioxide equivalent; SANDAG=San Diego Association of Government; SDG&E=San Diego Gas and Electric; EV=electric vehicle; PACE=Property Assessed Clean Energy; CSE=Center for Sustainable Energy; SDWD=San Dieguito Water District; CalRecycle=California Department of Resources Recycling and Recovery; OMWD = Olivenhain Municipal Water District

⁹ Reductions for ATP are assumed to be zero for 2020 to allow time for project design and implementation.

¹⁰ New measure added as part of 2020 Interim CAP Update.

Actions and supporting measures considered to be a “project” subject to the environmental review process under the California Environmental Quality Act (CEQA) may be streamlined using a CAP Consistency Review Checklist. CEQA guidelines require that a project perform an analysis of GHG emissions and potential climate change impacts from new development. With associated CEQA coverage, the 2018 CAP qualifies under Section 15183.5 of the CEQA Guidelines as a plan for the reduction of GHG emissions for use in cumulative impact analysis pertaining to development projects. Demonstrating consistency with a CAP Consistency Review Checklist establishes that a project will not result in an “additional environmental effect” in the City’s initial study checklist. Projects that do not demonstrate consistency may, at the City’s discretion, prepare a more comprehensive project-specific analysis of GHG emissions consistent with CEQA requirements. The Consistency Review Checklist will be prepared concurrent with CEQA review for the 2018 CAP.

4.2 Monitoring and Updates

The 2018 CAP presents a broad-based strategy to reduce GHG emissions and improve the sustainability and resilience of the community. However, the 2018 CAP will need to be updated and maintained if it is to remain relevant and effective. Thus, City staff will need to evaluate and monitor plan performance over time and make recommendations to alter or amend the plan if it is not achieving the proposed reduction targets. This will include periodic GHG emissions inventory updates and analyzing action and supporting measure performance.

The 2018 CAP is a dynamic document that will be continuously assessed and monitored. Regular monitoring and performance measuring of activities will allow the City to make timely adjustments to existing actions; replace ineffective or obsolete actions; or add new actions as technology, federal and State programs, and circumstances change. Adjustments will be made to the 2018 CAP if actions fall short of the targets or additional actions become available. As new data and resources, future federal and State legislation and regulations, improvements in energy and efficiency technology, new regional plans, updates to building standards, or new GHG emission calculation standards become available, the City may amend the 2018 CAP to provide additional flexibility or clarity. The City recognizes that flexibility in implementation is necessary to allow the City to evolve its strategies to achieve the most effective CAP.

Over time, new technology will become available and new federal and State laws will influence how GHG emissions are reduced. The City will need to be flexible to ensure the CAP remains effective and relevant.

4.2.1 CAP Monitoring Report

It is anticipated that the City will spend two years after the 2018 CAP’s adoption in January 2018 for initial start-up and to initiate data tracking. The City will conduct ongoing monitoring beginning in 2019 to track progress and identify where further efforts and additional resources may be needed. A monitoring report that summarizes the ongoing monitoring will be presented to the Environmental Commission and City Council biannually, which will include the status of action implementation using monitoring metrics and the progress in meeting the reduction targets.

Pursuant to Step 7 of the 2011 CAP’s Implementation Plan, the City has developed and implemented a systematic reporting process to inform decision makers and the public through an online GHG “dashboard,” which provides an annual report of measurements, monitoring, and management of key CAP activities. The CAP dashboard serves as a performance monitoring tool and can assist staff and policy makers in making objective decisions regarding CAP implementation. The CAP dashboard can be viewed here: www.EncinitasEnvironment.org.

4.2.2 Greenhouse Gas Emissions Baseline Inventory Updates

While based on extensive research and analysis, the City’s GHG inventory represents a snapshot in time. As technologies and markets change, and the City implements the actions and supporting measures in the 2018 CAP, new inventories will be prepared to track progress. As a result, the GHG inventory will be updated on a regular basis for an updated baseline year using current data and assumptions. Through the climate planning services offered via its Energy Roadmap Program, the San Diego Association of Governments (SANDAG) will be updating GHG emissions inventories every two years, beginning with the 2016 baseline year. To remain consistent with SANDAG’s schedule, the City will coordinate updates to its GHG inventory every two years beginning with the 2016 baseline year following adoption of the 2018 CAP. The GHG inventory updates will provide information about emission reductions over time, in comparison to the 2012 baseline inventory and 2020, 2030, and 2050 emission projections.

4.2.3 CAP Updates

Based on the findings from the monitoring reports and inventory updates, the City will continue to prepare CAP updates every five years beginning in 2023. Future CAP updates will be guided by recommendation by the City Council and Environmental Commission and will include updated baseline inventories, adjustments to reduction actions and supporting measures, as necessary, and any changes to land use projections to achieve consistency with zoning and then-current General Plan land use designations and policies.

CAP Implementation and Monitoring Schedule	
2018	CAP Adopted Council adopts CAP and staff begins to implement actions and supporting measures.
2018	Begin Implementation and Monitoring Staff performs initial start-up tasks and implementation of data tracking.
2018	GHG Emissions Baseline Inventory Update Staff conducts an update to the emissions inventory every two years, starting with the 2016 baseline year, consistent with SANDAG’s Energy Roadmap Program timeline.
2019	Annual CAP Monitoring Report Staff prepares and presents first annual monitoring report to City Council and Environmental Commission assessing the CAP’s annual performance in achieving targeted goals.
2023	CAP Update Based on findings from the annual monitoring reports and inventory updates, staff prepares a CAP update every five years.

4.3 Ongoing Engagement

As the City continues to implement and monitor progress on the 2018 CAP, continued engagement with and participation by the community is critical. This includes individual residents and businesses, community organizations, schools, developers, property owners, other local and regional government agencies, and others. While the 2018 CAP focuses on actions and measures in which the City has a role, many of the actions and measures require partnerships and collaboration.

The City is also committed to public education about the important role individuals play in combatting climate change and its effects. Education and outreach are especially key for the younger generation, as they will be exposed to the worsening impacts of climate change. The Encinitas City Council has a School District Liaison Commission (SDLC) which facilitates collaboration with local school districts. Ongoing engagement for the CAP will include coordination and educational outreach to local schools and school children through the SDLC and other avenues. Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. Many of the actions and measures in Chapter 3, as well as the strategies outlined in Chapter 5, are focused on increasing community awareness and participation in existing programs or connecting the community with new information, tools, funding, or resources to act. Thus, the 2018 CAP serves as a resource that supports community-based action. To meet the City and State's GHG reduction goals, individual participation will be key. Further, the City's CAP Dashboard will provide a publicly available, up-to-date inventory for City residents and stakeholders facilitating engagement in CAP Update activities.



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CHAPTER 5

Climate Adaptation

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Climate change is a global phenomenon that, over the long term, will cause a wide variety of impacts on human health and safety, economic vitality, water supply, ecosystem function, and the provision of basic services (California Natural Resources Agency [CNRA] 2012:3). Locally in the San Diego region, as well as throughout California, climate change is already affecting and will continue to affect the physical environment. Because impacts of climate change vary by location and other social and economic characteristics, it is important to specifically identify the projected severity of these impacts on the City of Encinitas (City) and the surrounding area.

The California Adaptation Planning Guide (APG), developed by California Office of Emergency Services (CalOES) and CNRA, helps communities throughout California plan for and adapt to the impacts of climate change. The APG includes a nine-step process, illustrated in Figure 5-1, which allows communities to assess their specific climate vulnerabilities and provides strategies for communities to reduce climate-related risks and prepare for current and future impacts of climate change.

The first phase of the nine-step process focuses on preparing a Vulnerability Assessment, which is a method for determining the anticipated impacts of climate change on community assets and populations. This phase evaluates a community’s level of exposure to climate-related impacts and analyzes how these impacts will affect a community’s populations, functions, and structures. The second phase of the process uses the information gathered in the Vulnerability Assessment to develop adaptation strategies and measures to help the community prepare for, respond to, and adapt to local climate change impacts. The strategies support a collaborative planning process that involves a variety of City departments and State agencies, including, but not limited to, CalOES, CNRA, and the California Department of Public Health (CDHP). This chapter serves as an abbreviated version of a full Vulnerability Assessment, identifies key climate-related risks faced by the City, and provides key strategies to increase the City’s climate resilience and adaptive capacity.

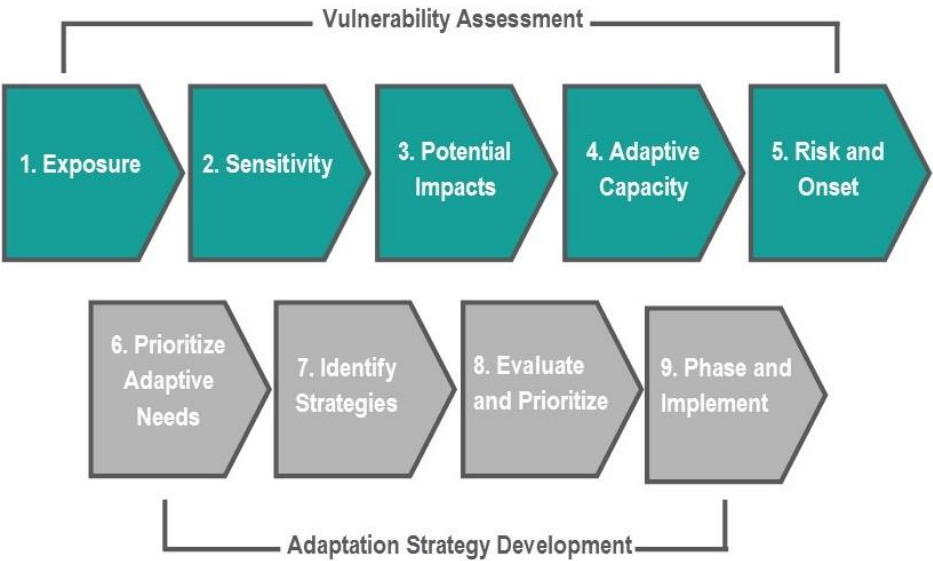


Figure 5-1: The Nine Steps in the Adaptation Planning Process

5.1 Climate Change Effects and Vulnerability Assessment

This section summarizes the climate-related impacts that may affect the City and evaluates how these impacts will potentially affect the community's populations, functions, and structures.

5.1.1 Climate Change Effects

The first step in the climate adaptation planning process is to assess the vulnerability of the City's populations, functions, and structures and the regional impacts of climate change. Using climate scenario planning tools, including Cal-Adapt and the U.S. Geological Survey's (USGS's) Coastal Storm Modeling System (CoSMoS 3.0), the assessment focuses on the climate-related impacts most likely to affect the City. Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) and the University of California, Berkeley Geospatial Innovation Facility. Cal-Adapt downscales global climate simulation model data to local and regional resolution under both high and low global greenhouse gas (GHG) emissions scenarios. CoSMoS is a dynamic modeling tool developed to predict coastal flooding because it includes both future sea level rise and storms integrated with long-term coastal evolution. Data from the CoSMoS modeling tool are used specifically in sea-level rise predictions and serve to identify the City's key sea-level rise vulnerabilities.



The projections included in the Vulnerability Assessment discuss impacts that the City will experience from mid-century to the end of the century (2050-2099). Climate-related impacts are included for both a Low-Emissions Scenario and a High-Emissions Scenario based on predictive scenarios included in the Intergovernmental Panel on Climate Change's (IPCC's) Fifth Assessment Report (AR5) published in 2014. The Low-Emissions Scenario assumes GHG emissions will peak around the year 2040 and begin to decline steadily. The High-Emissions Scenario assumes GHG emissions continue to rise strongly through 2050 and plateau around the year 2100.

The direct, or primary, changes analyzed for the City include average temperature, annual precipitation, and sea-level rise. Secondary impacts, which can occur because of individual changes or a combination of these changes, are also assessed and include extreme heat and its frequency, wildfire risk, and changes in hydrology (CNRA 2012:16-17).

Increased Temperature

Annual temperatures in the City are projected to increase steadily under both emissions scenarios. The City's historical average annual maximum temperature, based on data from 1950 to 2005, is 73.8 degrees Fahrenheit (°F). Under the Low-Emissions Scenario, annual average maximum temperature is projected to reach 77.5 °F by 2050 and 78.3 °F by 2099, a total increase of 4.5 °F (CEC 2017a). The annual average maximum temperature under the High-Emissions Scenario is projected to be 78.2 °F by 2050 and 83.1 °F by 2099, a total increase of 9.3 °F (2099) (CEC 2017b).

The City's historical average annual minimum temperature, based on data from 1950 to 2005, is 52.4 °F. Under the Low-Emissions Scenario, annual minimum temperature is projected to be 55.8 °F by 2050 and 57.4 °F by 2099, a total increase of approximately 5 °F (CEC 2017c). The annual average minimum temperature under the High-Emissions Scenario (where emissions continue to rise strongly through 2050 and plateau around 2100) is projected to reach 56.5 °F by 2050 and 61.5 °F by 2099, an increase of approximately 9.1 °F (CEC 2017d).

In urban areas, increased average temperatures, as well as more frequent and extreme heat events, can exacerbate the effects of urban heat islands. Urban areas are characterized by the predominance of asphalt, paved surfaces, and buildings combined with limited vegetation and green space. During periods of high temperatures, asphalt and darker surfaces tend to absorb and retain heat for longer periods of time. These effects can be exacerbated by activities such as operating vehicles, air conditioning units, as well as industrial activities. This phenomenon raises average temperatures in urban areas and is known as the Urban Heat Island Effect (UHIE). The UHIE can impact a City in several ways, including increased energy demand for cooling, decreased ambient air quality, and increased heat-related public health risks such as heat stroke, dehydration, and exposure to degraded air quality.

Increased Frequency of Extreme Heat Events and Heat Waves

Cal-Adapt defines the "extreme heat" day threshold for the City as 93.3 °F or higher. Historically (i.e., between 1960 and 2005, within the warmer season of April 1st through October 31st, where the maximum temperature exceeds the historical maximum temperatures), the City has experienced an average of four extreme heat days annually. Because of climate change, the number of extreme heat days is projected to increase substantially by 2099. Under the Low-Emissions Scenario, the City is projected to experience an average of 12 extreme heat days per year between 2090 to 2099, an increase of about eight days (CEC 2017e). Under the High-Emissions Scenario, the City is projected to experience an average of 37 extreme heat days per year between 2090 to 2099, an increase of about 33 days (CEC 2017f).

Heat waves can be defined as five or more consecutive extreme heat days. These events have been historically infrequent in the City, with no more than two heat waves occurring in a year. Climate change will likely cause a considerable rise in the frequency of heat waves in the City under both emissions scenarios. Under the Low-Emissions Scenario, projections show an increase of heat wave events, with roughly four per year at the middle of the century and up to seven per year in 2099. The High-Emissions Scenario also shows an increase in annual heat wave events, with up to five heat wave events occurring annually by midcentury and as high as 10 heat wave events occurring annually by 2099. Along with an increased frequency of heat events, heat waves are also projected to occur both earlier and later in the season. In the historic record, heat waves have started in August and ended in October; in the future, they will extend from June through October.



Increases in the severity and length of extreme heat events caused by climate change will affect the City's assets and population in several ways. Heat waves and extreme heat events, intensified by the UHIE, produce a number of public health risks, particularly for vulnerable populations including children, the elderly, and those who work outside (e.g. construction workers, agricultural workers). Heat waves and extreme heat events can cause a number of heat-related illnesses including heat cramps, heat exhaustion, and heat stroke, leading to increased hospital visits and emergency services.

Changes in Precipitation Patterns

While projections generally show little change in total annual precipitation in California, even modest changes could have a dramatic effect on California's ecosystems, which are conditioned to historic precipitation levels. Changes in weather patterns resulting from increases in global average temperatures could also result in a decreased proportion of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based on historical data and modeling, the California Department of Water Resources (DWR) projects that the Sierra Nevada spring snowpack will decrease by 25 to 40 percent from its historic average by 2050 and 48 to 65 percent by 2100 (DWR 2008:4, 2013:3-64). If GHG emissions continue unabated (i.e., the High-Emissions Scenario), the Sierra Nevada spring snowpack could decline by as much as 70 to 90 percent by 2100 (CEC 2017g).



Using Cal-Adapt's Annual Averages Tool, historical annual average precipitation in the City from 1950 to 2005 is estimated to be 10.9 inches. Under the Low-Emissions Scenario, annual precipitation in the City is projected remain or decrease slightly by 2050 (10.8 inches per year by 2050), and increase slightly to 11.6 inches per year by 2099, a rise of 0.7 inches per year (CEC 2017h). Under the High-Emissions Scenario, annual precipitation in the City is projected to increase to 11.1 inches by 2050 and 14.5 inches by the end of the century (2099), a total rise of 3.6 inches (CEC 2017i).

Increased temperatures, particularly in the Sierra Nevada region, which supports the State Water Project, as well as the Rocky Mountains, which heads the Colorado River, will lead to earlier and faster snowmelt and could leave the City vulnerable to water resource fluctuation during historically dry months (July-September). Additionally, as temperatures rise and snowpack decreases, the dry season may manifest earlier in the year and extend later, leading to a longer season of water insecurity. Further, as the climate warms, precipitation will fall more often at high elevations as rain rather than snow, which will reduce the Sierra Nevada and Rocky Mountain snowpacks that the City and surrounding regions need for surface water supply.

Increased Wildfire Risk

The City's landscape consists of rugged coastal terrain and includes one low-lying coastal ridge. There are several open space areas within the City, characterized by shrubs and native trees. During the dry months, the wildfire risk in these open, vegetated areas can increase when exacerbated by occasional Santa Ana winds and high temperatures. Additionally, extreme weather conditions, such as high temperature, low humidity, and/or winds of extraordinary force, may cause an ordinary,

localized fire to expand into a more intense and difficult to control wildfire. Currently, many homes within Encinitas are located in the urban-wildland interface (UWI), which is characterized by zones of transition between wildland and developed areas and often include heavy fuel loads that increase wildfire risk. These areas within Encinitas include neighborhoods near Saxony Canyon, South El Camino Real/Crest Drive, and Olivenhain. Most recently, the 1996 Harmony Grove wildfire in Encinitas resulted in the loss of three homes and the evacuation and sheltering of hundreds of Encinitas residents (San Diego County Multi-Jurisdictional Hazard Mitigation Plan [MHMP] 2015:5-80).

Increased temperatures and changes in precipitation patterns associated with climate change are expected to increase the risk of wildfire in the City. Cal-Adapt's Wildfire Tool can predict the potential increase in the amount of area at risk of burning through the year 2085, as compared to 2010 conditions. Under the Low-Emissions Scenario, the amount of area at risk of burning relative to 2010 levels would be approximately 1.3 percent greater in 2020 and remains similar through 2085. Under the High-Emissions Scenario, the amount of area at risk of burning remains at approximately 1.3 percent greater in 2020 and decreases slightly to 1.2 in 2085. Based on Cal-Adapt's Wildfire Tool, this increase in burned area is most likely to occur in eastern portions of the City, such as Lux Canyon, Saxony Canyon, the Manchester Preserve, and the areas surrounding Escondido Creek (CEC 2016j).

The California Department of Forestry and Fire Protection (CAL FIRE), in collaboration with the City, has developed the City's Fire Hazard Severity Zone Map, identifying Very High Fire Hazard Severity Zones (VHFHSZ) in the City that are included in the Local Responsibility Area (LRA) (See Appendix F). The map identifies three key areas in the City included in the VHFHSZ. The areas include the neighborhoods surrounding Saxony Canyon and the Encinitas Ranch Golf Course, neighborhoods surrounding and to the northeast of the Val Sereno Preserve, and properties directly north of San Elijo Lagoon near Interstate 5. Due to the topography and vegetation of these locations, surrounding properties are at increased risk of wildfire and associated hazards.



In addition to increased threats to human safety, the increased frequency of wildfire results in the release of harmful air pollutants into the atmosphere, which dissipate and can affect the respiratory health of residents across a broad geographical scope. Particulate matter (soot and smoke), carbon monoxide, nitrogen oxides, and other pollutants are emitted during the burning of vegetation, and can cause acute (short-term) and chronic (long-term) cardiovascular and respiratory illness, especially in vulnerable populations such as the elderly, children, agricultural and outdoor workers, and those suffering from pre-existing cardiovascular or respiratory conditions.

Additionally, wildfire can cause direct and indirect damage to electrical infrastructure. Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity. Furthermore, because of historical forest management trends over the past century, increased temperatures, and more frequent drought, California wildfires are characteristically hotter and more intense as compared to naturally occurring fire regimes. As such, soil structure and moisture retention are damaged leading to increased susceptibility to erosion or landscapes.

Increased Likelihood of Flooding

Climate change is predicted to modify the frequency, intensity, and duration of extreme storm events, such as sustained periods of heavy precipitation and increased rainfall intensity during precipitation events. These projected changes could lead to increased flood magnitude and frequency (IPCC 2001:14). Currently, the City experiences localized flooding in several areas during heavy rainfall and extreme weather events. These areas include “Restaurant Row” in Cardiff (south of San Elijo State Beach Campgrounds), Encinitas, and Cottonwood Creek and low-lying areas of Leucadia and Old Encinitas. Historically, the City has experienced property-related losses and damage because of localized flooding in Leucadia and coastal flooding in portions of Cardiff. Specifically, winter storms in 1997, 2005-2006, and 2010-2011 caused damage resulting in approximately \$500,000 in recovery and cleanup costs from the Federal Emergency Management Agency (FEMA) (MHMP 2015:5-81).

According to Cal-Adapt’s Annual Averages Tool, average annual precipitation in the City is currently 10.9 in. As discussed previously, annual average precipitation in the City is likely to remain the same under a Low-Emissions Scenario and increase slightly under a High-Emissions Scenario. Several factors determine the severity of floods, including rainfall intensity and duration. Flash floods occur when a large amount of rain falls over a short period of time. When accounting for a 125 centimeter (cm) increase in mean sea level by 2099 in CoSMoS, the City is likely to experience an increase in flood-prone low-lying areas. The majority of the area subject to this increased flood risk is located in and around the San Elijo Lagoon State Marine Conservation Area (USGS 2013).

The City’s flooding potential will also be exacerbated when experiencing atmospheric rivers, or narrow streams of warm, concentrated precipitation often resulting in the deposition of considerable rainfall over a short period of time. Under higher emissions scenarios wherein temperatures are expected to increase more when compared to lower emissions scenarios, the intensity and magnitude of atmospheric rivers are expected to become more severe, resulting in increased regional and localized flooding (Dettinger 2011).

During flooding events, infrastructure (e.g., roadways, power lines) may be damaged, in turn disrupting communications, energy transmission, public services, and transportation systems. Floodwaters during storm events can interact with sources of pollution and distribute hazardous pollutants locally and regionally. The resulting water contamination may lead to human health impacts as well as degradation of ecosystems. Flood events can also cause considerable property damage through flooding damage, as well as structural damage, through erosion and increased risk of mudslides. In consideration of these efforts, aside from the following proposed strategies, the City should continue to participate in updates to the MHMP when appropriate to comprehensively assess and plan for all local hazards that may be intensified by climate change.

Sea-Level Rise

An important impact of global climate change is sea-level rise. The average global sea-level rose approximately 7 inches during the last century. If sea-level changes along the California coast continue to reflect global trends, sea-level along the State’s coastline in 2050 could be 10-18 inches (0.25-0.45 meters [m]) higher than in 2000, and 31-55 inches higher (0.78-1.4 m) than 2000 levels by the end of this century (CEC 2012:9). According to the MHMP for the region, sea-levels measured in La Jolla show a 6-inch rise over the last century (OES 2015a).

Considering the City's location, which runs along the coastline, sea-level rise is an important concern for potential climate-related risks. Sea-level rise may endanger the City in several key ways, including property damage to development along the coast; damage to transportation, electrical, and wastewater infrastructure; and compromised or lost public access to the coast. Sea-level rise can also have considerable effects on coastal ecosystems, such as rocky intertidal areas, beaches, dunes, wetlands, estuaries, lagoons and tidal marshes, tidal flats, eelgrass beds, and tidally-influenced streams and rivers (CCC 2015). Impacts can include coastal bluff erosion; alterations in long-shore sediment transport; and salt water intrusion into wetlands, estuaries, and aquifers.



Historically, the City has already experienced considerable coastal erosion from El Niño storms in 1982-1983, which eroded sand from beaches by up to 20 feet (ft.) in depth, structurally compromising bluffs and damaging coastal homes in the City. Segments of shoreline along Moonlight Beach and Cardiff-by-the-Sea are at great risk of coastal inundation from storm wave run-up with future sea-level rise. Destabilized coastal cliffs at Stonesteps Beach caused a bluff failure, resulting in a fatality. Public safety is the top priority for Encinitas so reducing the possibility of bluff failures is of the highest importance.

The City, in collaboration with the San Diego Foundation and Local Governments for Sustainability (ICLEI), is in the process of developing the San Diego Regional Coastal Resilience Assessment, a report to assess the vulnerability of coastal assets in Encinitas. The report uses CoSMoS to assess potential sea-level rise impacts on the City and surrounding area. The report identifies potential risks from sea-level rise to key assets in the City including the building stock, stormwater infrastructure, wastewater treatment systems, transportation infrastructure, beach and coastal access, and local ecosystem health.

As noted in the San Diego Regional Coastal Resilience Assessment, a 2012 National Research Council report projected sea-level rise in the San Diego region to rise 4-30 centimeters (2-12 inches) by 2030, 12-61 centimeters (5-24 inches) by 2050, and 42-167 centimeters (17-66 inches) by 2100, relative to 2000 levels. Based on this and other sea-level rise studies considered, this report utilizes a 50-centimeter increase in sea-level by 2050, and a 200 centimeter rise in sea-level by 2100. As the report notes, these higher-end sea-level rise scenarios have been chosen to encourage a risk-averse approach to planning for sea-level rise resilience.

Through the use of a Vulnerability Assessment specific to sea-level rise, the Regional Coastal Resilience Assessment provides information on how sea-level rise will affect the City. Table 5-1 provides brief summaries of the key areas within the City that may be affected by sea-level rise. Full descriptions of these impacts are provided in the San Diego Regional Coastal Resilience Assessment.

Table 5-1 Potential Sea-Level Rise Impacts in Encinitas for 2050 and 2100	
Impact Sector	Vulnerability Areas
Buildings Stock	<ul style="list-style-type: none"> • Low-lying areas surround San Elijo Lagoon • Erosions impacts to residential areas near Sea Cliff County Park
Social Sector	<ul style="list-style-type: none"> • Census tract 177.02, located North of B Street and South of Leucadia Street Census tract 177.01 North of Leucadia Street may be adversely impacted by and have difficulty revering from sea-level rise impacts due to high unemployment rates in this area. • Declines in tourism are expected to directly impact service-economy employees
Storm Water	<ul style="list-style-type: none"> • Storm water systems north and west of San Elijo Lagoon (See Figure 5.2) and outlets on Moonlight Beach will be impacted by 2100. • Cliff retreat has a high potential impact on the stormwater system, including for inlets and outlets west of South Coast Highway 101 between San Elijo Lagoon and Sea Cliff County Park.
Wastewater	<ul style="list-style-type: none"> • By 2100, flooding is projected to impact Cardiff Sewer Pump Station, sewer system infrastructure surrounding San Elijo Lagoon, wastewater infrastructure at Moonlight Beach, and two lift stations in Batiquitos Lagoon. • Higher water levels could potentially cause sewer spills into environmentally sensitive areas, such as the mouth of San Elijo Lagoon.
Drinking Water	<ul style="list-style-type: none"> • By 2100, aboveground water distribution components, such as valves, meters, and service points north and west of San Elijo Lagoon will be exposed to impacts of flooding.
Transportation	<ul style="list-style-type: none"> • Sections of Highway 101 near San Elijo Lagoon with experience flooding impacts by 2050 and 2100. • Erosion is projected to impact Coast Highway 101 south of the Self-Realization Fellowship Temple and local roads along the coastal bluff, including Neptune Ave and 4th Street.
Beach and Public Access	<ul style="list-style-type: none"> • Boneyard Beach and D Street Beach, located south of Moonlight Beach, also are projected to experience shoreline change. • Cardiff State Beach-Seaside and Cardiff State Beach-North Beach are located along the San Elijo Lagoon, which is projected to be impacted by flooding and shoreline change.
Biodiversity and Habitat	<ul style="list-style-type: none"> • Eighty-six species within the study area are categorized as sensitive species, including the California Least Tern, the Western Snowy Plover, and the Ridgway Rail.
Source: San Diego Regional Coastal Resilience Assessment Draft Report (2017)	

5.2 Current Adaptation Efforts

The City is addressing many of the challenges associated with climate change impacts through existing local policies, plans, programs, resources, and institutions. As highlighted in the 2015 MHMP, the City has begun to identify existing plans and policies, and key City staff, which can contribute to the City's climate adaptation efforts. As part of the MHMP, the City has adopted several Goals, Policies, and Objectives relevant to climate adaptation. As the City continues to conduct current and future planning efforts, it is critical that climate change and climate-related risks are incorporated into efforts to protect City residents and create a climate resilient community. The following sections discuss how the City is currently working to address each of the climate-related impacts.



Figure 5-2: Annual wave impacts in San Elijo State Beach (2099) (The locations marked in yellow highlight areas where increased erosion is expected.)

Source: USGS 2013

Efforts Related to Increased Temperature and Extreme Heat Events

The 2015 MHMP included several objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 7 of the 2015 MHMP Chapter on Encinitas intends to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of severe weather, including extreme heat” (MHMP 2015:5-97). The goal includes three corresponding objectives and seven actions to help the City prepare for the impacts of extreme heat events. Objectives and actions focus on urban heat islands, vulnerable populations susceptible to extreme heat, and emergency services.

Efforts Related to Changes in Precipitation Patterns

Goal 8 of the MHMP Chapter on Encinitas is intended to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to drought” (MHMP 2015:5-98). The goal includes four corresponding objectives and 11 actions to help the City prepare for the impacts of drought events. Objectives and actions focus on protecting assets that may be damaged by drought (e.g. trees, landscaping), and increasing the use of recycled water for City landscaping and educating citizens about drought preparedness.

The City relies on a combination of water resources to support the City’s water services. The City is served by two water districts. San Dieguito Water District (SDWD) supplies potable water to approximately 38,000 residents within the City and the remainder of the City is served by the Olivenhain Municipal Water District (OMWD). The City receives raw water resources from several sources, including Lake Hodges and the San Diego County Water Authority (SDCWA). SDWD has a Water Conservation Division, which administers outreach, education, and incentive programs to help residents and businesses reduce water consumption in the District. The City also uses recycled water from the San Elijo Water Reclamation Facility to irrigate City-owned facilities, such as the Encinitas Ranch Golf Course and landscaped traffic medians in the City. For each water district, the proportion of water from each source can vary significantly from year to year. For example, in the San Dieguito Water District, on average, approximately 30% of the water supply comes from Lake Hodges, 60% of the water supply is imported from the Colorado River and State Water Project, and 10% is recycled water from the San Elijo Joint Powers Authority.

Efforts Related to Increased Wildfire Risk

Goal 4 of the MHMP Chapter on Encinitas is intended to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure and City-owned facilities, because of wildfires/structural fires” (MHMP 2015:5-93). The goal includes three corresponding objectives and 16 actions to help the City prepare for the impacts of wildfire events. Objectives and actions focus on improving emergency response efforts related to wildfires, protecting key City assets susceptible to wildfire impacts, and educating residents about wildfire preparedness.

In 2008, the City of Encinitas Fire Department received a FEMA Fire Prevention and Safety Grant to conduct a public education program to educate Encinitas residents on defensible spaces, firewise gardening techniques, and how best to protect homeowners from wildfires. The program included a defensible space miniature exhibit house and garden at San Diego Botanic Gardens.

In 2013, the City worked with CAL FIRE, to develop the City’s Fire Hazard Severity Zone Map. The map identifies the VHFHSZ within the City, locating regions in the City at increased risk of wildfire risk and related hazards.

Efforts Related to Increased Likelihood of Flooding

Goal 5 of the MHMP Chapter on Encinitas is aims to “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of flooding/dam failure” (MHMP 2015:5-94). The goal includes four corresponding objectives and 19 actions to help the City prepare for the impacts of flooding events. Objectives and actions focus on improving local and regional emergency response efforts related to flooding, protecting key City assets susceptible to flooding impacts, educating residents about flooding preparedness, and improving building and development standards to prevent flood risk.

Efforts Related to Sea Level Rise

While the MHMP does not include a specific goal about sea-level rise, Goal 6 does mention sea-level rise: “[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of coastal erosion/coastal bluff failure/storm surge/tsunami/sea-level rise (MHMP 2015:5-97). The objectives and actions included under this goal will serve to better prepare the City for sea-level rise and its consequences, such as coastal erosion, increased storm-wave run-up, beach loss, and slope failure on coastal bluff faces. Objectives and actions under this goal focus on protecting key City assets susceptible to coastal erosion, better plan and prepare for coastal erosion and storm surge events, and educate citizens about the risks of coastal erosion, coastal bluff failure, storm surge, tsunamis, and sea-level rise.

In 2012, ICLEI published the Sea-Level Rise Adaptation Strategy for San Diego, a regional climate adaptation planning document focused on strategies to prepare the region for sea-level rise. As the report notes, by mid-century the San Diego region will experience “regularly-occurring inundation of certain locations and assets, some of which are being planned and built today” (ICLEI 2012: iv). The report also highlights the most vulnerable aspects to the region as stormwater management, wastewater collection, shoreline parks and public access, transportation facilities, commercial buildings, and ecosystems (ICLEI 2012). Building upon the 2012 report, the San Diego Regional Coastal Resilience Assessment will evaluate the impacts of sea-level rise on coastal Encinitas and provides tailored adaptation strategies to help the City prepare for these impacts. This document will serve to help the City in future sea-level rise planning efforts and help the City become more resilient to the long-term impacts of sea-level rise and climate change.

The City is currently working on a series of Encinitas-specific planning efforts to increase community and local ecosystem resiliency to the impacts of sea-level rise.

Cardiff Beach Living Shoreline Project

In collaboration with the State Coastal Conservancy and the California State Parks, the City is currently working to develop the Cardiff Beach Living Shoreline Conceptual Plan. The plan supports efforts for a local dune restoration project to restore heavily impacted coastal habitat and provide natural sea-level rise adaptation by protecting a vulnerable segment of Cardiff Beach. Currently in the development phase, the plan will provide innovative approaches for climate resiliency and sea-level rise adaptation, buffering the City from storm surge and flooding during extreme weather events.



Figure 5-3: Cardiff Beach, Encinitas, CA

Source: City of Encinitas 2017

U.S. Army Corps of Engineers Coastal Storm Damage Reduction Project

The City of Encinitas and Solana Beach have partnered to bring a 50-year beach nourishment project with the support from the US Army Corps of Engineers and the State Parks and Recreation Department. This project would provide stability and resiliency to the coastline for the next 50 years.

Opportunistic Beach Fill Program

The Opportunistic Beach Fill Program identifies construction project that export sandy beach material and then haul the material to the beach at Moonlight, Cardiff, Leucadia or Ponto State Beach. The City works with developers to conduct monitoring and permitting and share the cost for hauling the material to the beach.

San Elijo Lagoon Restoration Project

The San Elijo Lagoon Conservancy, in coordination with the City and relevant State agencies, will soon begin work on the San Elijo Lagoon Restoration Project. The project consists of selective dredging and filling of the mudflats and salt marsh habitat within the lagoon, intended to improve tidal circulation and restore sensitive habitats currently compromised by surrounding land uses. Once completed, the project will provide continuity of habitats currently threatened by sea-level rise and provide increased adaptive capacity for the surrounding communities during flooding and extreme weather events. This project will add 300,000 cubic yards of material to the beach and nearshore environment which will improve coastal resiliency for years.



Figure 5-4: San Elijo Lagoon near Encinitas, CA

Source: San Elijo Conservancy Website Courtesy of Chris Hoover

5.3 Resiliency and Adaptation Strategies

This section outlines strategies for the City for improving community resiliency and adaptation to the current and future impacts of climate change. These strategies can also be considered for incorporation into the next update of the City's Safety Element of the General Plan, pursuant to the requirements of SB 379 (Statutes of 2016), as well as in future updates to the MHMP to further its climate adaptation efforts. Future planning efforts in the City will use these proposed strategies to better integrate climate adaptation planning efforts into all relevant plans, policies, and programs.

Adaptation strategies are classified into five categories to address the climate change impacts identified in the vulnerability assessment (i.e., temperature, precipitation, flooding, wildfire, and sea-level rise). Each category includes programs and policies to support climate resiliency and adaptation, focusing on specific vulnerabilities and impacts that have the potential to impact the community's populations, functions, and structures. The proposed strategies also have the potential to provide other important benefits to the community, or co-benefits.

Strategies are categorized as follows:

- Prepare for Increase in Temperatures and Extreme Heat
- Prepare for Changes in Precipitation Patterns and Water Supply
- Prepare for Increased Wildfire Risk
- Prepare for Increase Flood Risk
- Prepare for Sea-Level Rise

5.3.1 Prepare for Increases in Temperature and Extreme Heat

Rising temperatures caused by climate change will exacerbate the UHIE and increase the frequency and duration of extreme heat events. The City will take actions to mitigate temperature-related effects and improve heat resiliency to protect its populations, functions, and structures in the short- and long-term. To mitigate the impacts of the UHIE, the City will implement the following strategies which also provide co-benefits to the community.

- **Strategy 1:** Incorporate green infrastructure strategies into new and existing infrastructure to mitigate the effects of the UHIE by reducing the area of heat-absorbing paved surfaces and increasing landscaped area with planted vegetation, including shade trees. Examples of green infrastructure include street trees, climate-appropriate landscaping, green and cool roofs, and heat-reflective surfaces and materials. These actions will decrease instances of heat-related illness, improve air quality, and lower energy costs associated with indoor cooling.
- **Strategy 2:** Promote the use of solar carports on new and existing surface parking lots to mitigate heat absorption and increase shaded areas for the City's population. Implementation priority will be given to City-owned parking lots to serve as example solar carports. Solar carports would additionally provide GHG-reducing co-benefits by increasing distributed solar generation and, if electric vehicle charging stations are added, improving charging accessibility.
- **Strategy 3:** Promote the use of passive cooling design (e.g. appropriate building orientation, shade trees, window shading, cool roofs) and use the California Building Standards Code (CalGreen) voluntary measures for residential and nonresidential buildings to improve energy efficiency. Other energy efficiency measures (e.g. air sealing improvements, whole house fans, energy efficient air-conditioning units) should be encouraged in new development within the City to reduce demand for air conditioning and help reduce energy costs.

The City will pursue the following strategies to protect the City residents from extreme heat events, focusing attention on the vulnerable populations most at risk from these events.

- **Strategy 4:** Conduct outreach to educate City residents on the health risks associated with extreme heat events and strategies to prepare for these events. Alongside general outreach, particular focus should be given to educating populations vulnerable to extreme heat including children and the elderly.
- **Strategy 5:** Coordinate with relevant agencies including, but not limited to, the San Diego County Office of Emergency Services, San Diego Unified Disaster Council, and San Diego Fire Department to better plan and prepare for extreme heat events and the increased demand for emergency services associated with these events. Coordinated efforts should include improving Heat-Health Alert Warning Systems, identifying key vulnerable populations within the City in preparation for heat related events, and coordinating with local health care institutions (e.g. Scripps Memorial Hospital) to increase extreme heat preparedness and resiliency.
- **Strategy 6:** Work with local and regional employers to ensure worker protection measures are in place for extreme heat events. Measures may include assurance of adequate water, shade, rest breaks, and training on heat risks for all employees working in the City.

- **Strategy 7:** Work with local businesses and institutions to provide a network of “Cool Zone” areas (i.e., cooling centers) for vulnerable residents to rest in air-conditioned environments during high temperature periods and heat wave events. Cooling centers can include locations like the Encinitas Library and the Encinitas Community and Senior Center. Work with the local school districts to ensure every school has air conditioning.
- **Strategy 8:** Participate in beach nourishment projects that maintain local wide sandy beaches. Encinitas beaches are considered regional “Cool Zones.” By maintaining the beach width, the City will be able to handle larger numbers of coastal visitors, when needed, keeping the public a safe distance from the bluffs.

5.3.2 Prepare for Changes in Precipitation Patterns and Water Supply

The City’s reliance on various regional water resources, including the San Diego Water Authority, will remain a critical issue for the City’s resilience to drought periods. The City will consider how future supply and demand for water resource in the region may change because of climate change. Considering the potential decrease in regional water resources available to the City due to decreases in annual precipitation, the City will implement the following strategies to increase the community’s resilience with regards to water supplies.

- **Strategy 1:** Coordinate with local and regional partners (SDWD, OMWD, SDCWA) to support and improve water conservation efforts and programs for City residents. Coordinate with these agencies to provide educational outreach to residents on how best to conserve water and reduce water demand.
- **Strategy 2:** Expand and/or improve the recycled water efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts to ensure that, when economically viable, all current and future city landscaping can source the majority of landscaping water needs from recycled sources.
- **Strategy 3:** Work with relevant water agencies, including SDCWA, OMWD, and SDWD, to evaluate current and future water supply systems and vulnerabilities and how water resources may be impacted by climate change.
- **Strategy 4:** Continue marketing and outreach program to promote participation in existing water conservation rebate and incentive programs in the region. Current programs for southern California include Water Smart San Diego (SDCWA), SoCal WaterSmart (Metropolitan Water District), and SDWD’s free sprinkler nozzle program.
- **Strategy 5:** Expand upon the City’s existing Water Efficient Landscape Regulation to promote the use of climate appropriate landscaping (e.g., xeriscaping) to reduce demand for potable water resources among City residents. Promote current funding available through the Save Our Water Turf Replacement Rebate Program sponsored by DWR.

5.3.3 Prepare for Increased Wildfire Risk

Like many communities in the region, the City will likely experience increased wildfire risk in the future. The information gathered in the Vulnerability Assessment has been utilized to develop key

strategies for the City to implement regarding the increased wildfire risk as a result of climate change. The strategies focus on key areas within the City that are most vulnerable to wildfire risk, such as residences and businesses that are located in the UWI within the City. The City will implement the following strategies to address increased wildfire risk.

- **Strategy 1:** Coordinate with relevant agencies including OES, the California Department of Forestry and Fire Protection (CAL FIRE), and the Encinitas Fire Department to map and identify current and future land uses, neighborhoods, and infrastructure that are at a high risk of experiencing wildfire impacts.
- **Strategy 2:** Continue to update the MHMP every five years as required by the state to comprehensively plan for current and future wildfire risks within the City and work to implement all strategies in the City's current MHMP.
- **Strategy 3:** Update the Safety Element of the City's General Plan consistent with the Office of Planning and Research (OPR) General Plan Guidelines, which requires adopted safety elements to consider climate change and climate adaptation strategies pursuant to SB 379.
- **Strategy 4:** Work with relevant State agencies, including OES and CAL FIRE, to improve coordination for emergency services related wildfire and related events in the City. Consider the development of a Community Wildfire Protection Plan to increase community resilience too wildfire events.
- **Strategy 5:** Consider new development standards for City residents and businesses within the UWI, such as incorporating defensible space practices into landscape requirements for neighborhoods at increased risk of wildfire. Residential areas that should be considered for new standards include neighborhoods surrounding Lux Canyon, Saxony Canyon, the Manchester Preserve, and Escondido Creek.

5.3.4 Prepare for Increased Flood Risk

As discussed in Section 5.2, the City will experience a slight increase (0.7 inches a year) in average annual precipitation under a Low-Emissions Scenario, and an increase of 3.6 inches a year under a High-Emissions Scenario by 2099. Currently, the large majority of established development and associated infrastructure within the City is outside of the FEMA 100-year flood plain. Considering the noticeable increase in annual average precipitation under the High-Emissions Scenario for 2099, the City should begin planning for increased risk of flooding events. The information gathered in the Vulnerability Assessment has been used to develop specific strategies to help the City and prepare for increased flood risk. The City will implement the following proposed strategies.

- **Strategy 1:** Conduct a comprehensive assessment of all stormwater and wastewater infrastructure in the City and analyze how this infrastructure may be affected or compromised by increased risk of flooding events.
- **Strategy 2:** Coordinate with relevant agencies such as OES and the Encinitas Public Works Department to map and identify all critical facilities and infrastructure that may be compromised by increased flood risk. The City should plan accordingly for upgrades, relocation of facilities and infrastructure or identify beach nourishment projects to better prepare for increased risk of flooding events.

- **Strategy 3:** Coordinate with relevant agencies such as FEMA, OES and the Encinitas Fire Department to better plan and prepare emergency services required for flooding events including evacuation services, flood management services and recovery services.
- **Strategy 4:** Continue local and regional ecosystem restoration efforts that will result in increased climate resiliency for flooding events within the City.

5.3.5 Prepare for Coastal Erosion and Predicted Sea-Level Rise

Coastal erosion and sea-level rise are a significant threat to the community. The City should continue to incorporate coastal erosion and predicted sea-level rise into all planning programs and policies in the future. Consistent with the MHMP, hazard mitigation planning efforts should continue to incorporate the short- and long-term impacts that sea-level rise will have on the City, specifically in areas with development along the coastline. The City should be prepared for catastrophic failures along the coastline and be prepared to work with FEMA on existing conditions reports, failure reports and how to obtain FEMA funding to repair impacts because of flooding. Once completed, the City should use the San Diego Regional Coastal Resilience Assessment, developed by San Diego Foundation and ICLEI, as the guiding document for all planning efforts within the City related to sea-level rise. As discussed previously, sea-level rise may impact the City in several key ways including coastal erosion, cause property damage to development along the coast and cause damage to transportation, electrical, and wastewater infrastructure. The City will implement the following strategies to address risks related to sea-level rise:

- **Strategy 1:** Support and monitor ongoing analysis of sea-level rise data relevant to the City's planning efforts. Continue to incorporate the most up-to-date information on sea-level rise into relevant planning documents including the Safety Element of the City's General Plan.
- **Strategy 2: Develop a Coastal Resiliency Mitigation Report to coordinate FEMA, tsunami mapping and the CoSMoS predictions for sea level rise.** Utilize maps and FEMA Hazus software to estimate potential losses from tsunamis or sea level rise to map and display hazard data and the results of damage and economic loss estimates for building and infrastructure. By estimating losses, it provides a basis for developing mitigation plans and policies, emergency preparedness and response and recovery planning. Additionally, provide assistance to residents currently at risk of coastal erosions in preparing for future impacts.
- **Strategy 3:** Develop a comprehensive outreach strategy to receive stakeholder input and educate residents about sea-level rise and how the community can best prepare for these impacts.
- **Strategy 4:** Continue to implement current efforts focused on beach nourishment, coastal bluff improvements and wetland restoration, prioritizing projects that will mitigate the impacts sea-level rise including coastal erosion and saltwater inundation.
- **Strategy 5:** Coordinate with relevant agencies including FEMA, and OES to prepare and plan for the impacts of coastal erosion, sea-level rise, and coastal storm surge, continuously updating and utilizing the most relevant strategies and guidance provided by relevant agencies and institutions.
- **Strategy 6:** Continue to map critical infrastructure in the City that may be impacted by sea-level rise and work with City's Public Works Department to plan accordingly.

5.3.6 Community Education

While preparing for future climate change is essential to the safety and health of the Encinitas community, it is important to recognize that residents and businesses within the community should also be preparing for climate change. Future safety in the home and the success of a business will, in part, be dependent upon how prepared residents and businesses are for anticipated climate change. The first step in preparation is becoming aware of climate change impacts and how these may affect local neighborhoods, families, children and businesses. The City will develop programs to educate local residents and businesses about climate change and how to prepare at home, at school or in your workplace. Climate change education and outreach should have a particular focus on educating younger generations within the community, through school programs and age-appropriate engagement, as they are the residents that will be most impacted by future climate changes. The City will implement the following strategies to address community education about climate change:

- **Strategy 1:** Work with local community organizations to develop a climate change education outreach program focused on residents.
- **Strategy 2:** Work with local businesses and business organizations to develop a climate change education outreach program focused on local businesses and the economy.
- **Strategy 3:** Work with local schools, school districts and other educational organizations to develop a climate change education outreach program focused on children and future generations.

As shown in Section 5.3, the City will experience a series of considerable climate change impacts by 2050 and 2100. This assessment has shown that increased wildfire risk and sea-level rise are likely the most severe impacts to be experienced by the City. Several key areas in the City and surrounding areas, such as the San Elijo Lagoon and State Park, are projected to experience the highest sea-level rise and flooding impacts. Neighborhoods surrounding the City's open space areas, such as Saxony Canyon and the Encinitas Ranch Golf Course, are at increased wildfire risk. Considering the City's coastal geography, sea-level rise and coastal flooding will likely be the most expansive and persistent climate related impact the City will experience over the long term. Based on the foregoing, it is recommended that the City complete a comprehensive coastal vulnerability study to help better understand and provide guidance for future resilience planning efforts in the City.

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CHAPTER 6

References

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Appendix A

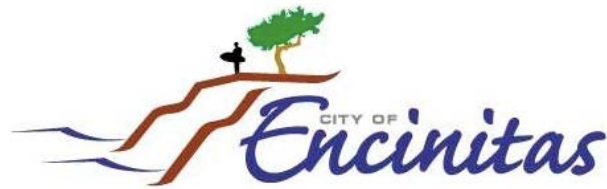
Greenhouse Gas Emissions Inventory and Projections

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City of Encinitas Greenhouse Gas Emissions Inventory and Projection

September 2017

Prepared for the City of Encinitas



Prepared by the Energy Policy Initiatives Center



About EPIC

The Energy Policy Initiatives Center (EPIC) is a non-profit research center of the USD School of Law that studies energy policy issues affecting California and the San Diego region. EPIC's mission is to increase awareness and understanding of energy- and climate-related policy issues by conducting research and analysis to inform decision makers and educating law students.

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1 Overview

This document presents a summary of the greenhouse gas (GHG) emissions for the City of Encinitas in 2012 and 2013, and the business-as-usual (BAU) emissions projection for the future years 2020, 2030 and 2050.

Section 2 provides background sources and common assumptions used to estimate GHG emissions and project these into the future. Section 3 provides the result of the GHG emissions in 2012 and 2013. Details on the method used to estimate emissions in each category are provided in Section 4. Section 5 provides emissions projection and the methods used to project future year emissions.

2 Background

2.1 Greenhouse Gases

The primary greenhouse gases (GHGs) included in the GHG emissions estimates presented here are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Each GHG has a different capability of trapping heat in the atmosphere, known as its global warming potential (GWP), which is normalized relative to CO₂ and expressed in carbon dioxide equivalent (CO₂e). In general, the 100-year GWPs reported by the Intergovernmental Panel on Climate Change (IPCC) are used to estimate greenhouse gas emissions. The GWPs used in this inventory are from the IPCC Fourth Assessment Report (AR4),¹ provided in Table 1.

Table 1 Global Warming Potentials (GWPs) Used in Encinitas GHG Emissions Inventory and Projection

Greenhouse Gas	Global Warming Potential (GWP)
Carbon dioxide (CO ₂)	1
Methane (CH ₄)	25
Nitrous oxide (N ₂ O)	298

2.2 Categories of Emissions

The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions published by ICLEI USA (referred to as the U.S. Community Protocol) requires a minimum of five basic emissions generating activities to be included in a Protocol-compliant community-scale GHG inventory. These categories are: electricity, natural gas, on-road transportation, water and wastewater, and solid waste.² GHG emissions are calculated by multiplying activity data (e.g., kilowatt-hours of electricity, tons of solid waste) by an emission factor (e.g., pounds of CO₂e per unit of electricity). For these five categories,

¹ IPCC Fourth Assessment Report: Climate Change 2007. Direct Global Warming Potentials. (2013) https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

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

methods used in this inventory were based on the U.S. Community Protocol standard methods and modified with regional- or city-specific data when available.

Additionally, GHG emissions from off-road transportation were included in the inventory and projection, based on the methods and models used by California Air Resources Board (ARB) in the statewide GHG emission inventory.³

2.3 Demographics

The San Diego Association of Governments (SANDAG), San Diego's regional planning agency, estimates and forecasts population and employment for all jurisdictions in the San Diego region.⁴ The population and jobs estimates in 2012 and 2013, and forecast for 2020, 2030 and 2050 are provided in Table 2.⁵

Table 2 Population and Jobs Estimates in City of Encinitas

Year	Population	Jobs
2012	60,057	26,165
2013	60,482	26,304
2020	62,908	27,275
2030	64,938	27,958
2050	66,670	29,551

2.4 Rounding of Values in Tables and Figures

Within the tables and figures throughout the document, rounding is often required. Values are rounded to the nearest integer of a higher order of magnitude. Values are not rounded in the intermediary steps in the actual calculation. As a result of rounding, some totals may not equal the values summed.

3 Summary of GHG Emissions Inventory

The total GHG emissions from Encinitas in 2012 were estimated at 483,773 metric tons CO₂e (MT CO₂e), distributed into the categories as shown in Figure 1.

³ California Air Resources Board (ARB). California Greenhouse Gas Emission Inventory – 2016 Edition. (June 2016) <http://www.arb.ca.gov/cc/inventory/data/data.htm>

⁴ SANDAG. 2050 Regional Growth Forecast. <http://www.sandag.org/>

⁵ The population in 2012 and 2013 are from SANDAG's Demographic & Socio Economic Estimates (Updated in September 2015). The population in 2020, 2030 and 2050, and civilian jobs in 2012, 2020, 2030 and 2050 are from SANDAG's Series 13 Regional Growth Forecast (Updated in October 2013). Download Date: 12/06/2015. SANDAG Data Surfer. <http://datasurfer.sandag.org/>. The civilian jobs estimate in 2013 is interpolated linearly based on the 2012 and 2020 jobs estimates.

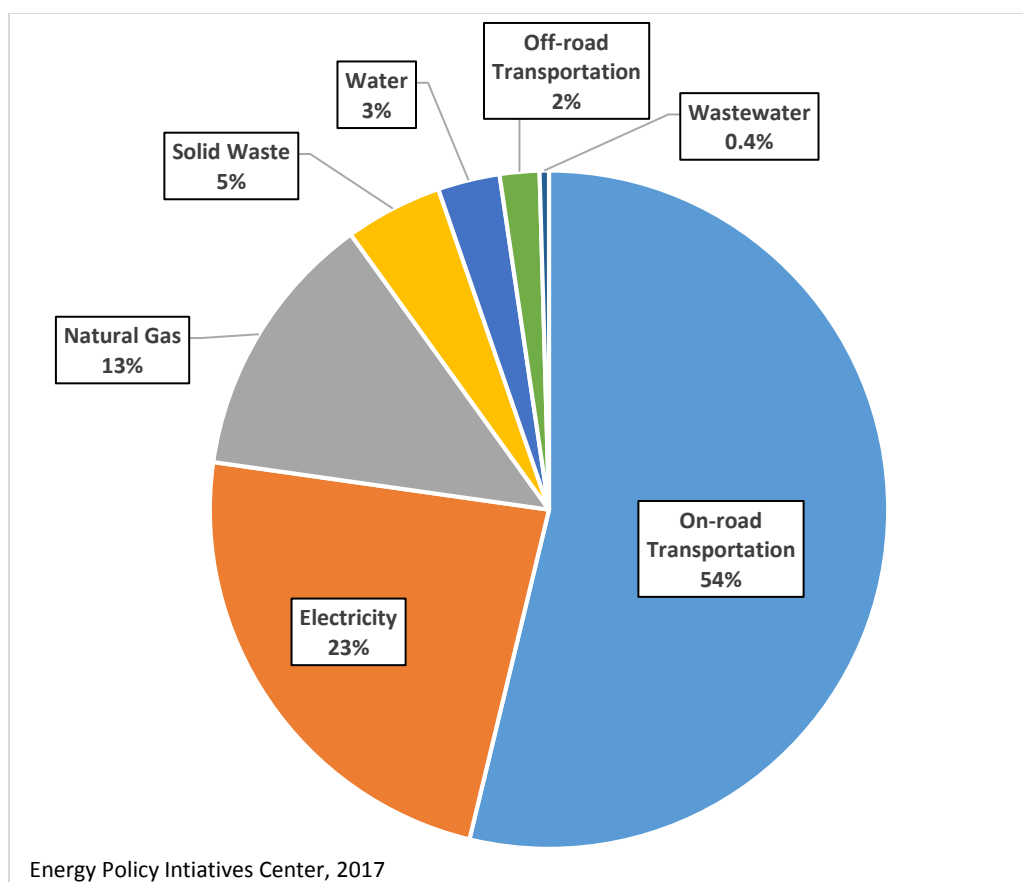


Figure 1 Breakdown of GHG Emissions in Encinitas (2012)

The on-road transportation category contributed the most (54%) to the overall GHG emissions in 2012, while the wastewater category contributed the least (<1%). The total GHG emissions in 2013 were estimated at 479,994 MT CO₂e, 1% lower than the total emissions in 2012 but with a similar distribution among the emissions categories. The total and breakdown of emissions by category are presented in Table 3.

Table 3 Total and Breakdown of GHG Emissions in Encinitas (2012 and 2013)

Emissions Category	2012 GHG Emissions (MT CO ₂ e)	2013 GHG Emissions (MT CO ₂ e)
On-road Transportation	260,127	255,362
Electricity	113,556	109,774
Natural Gas	62,027	65,173
Solid Waste	22,471	23,892
Water	14,299	14,474
Off-road Transportation	9,138	9,149
Wastewater	2,155	2,170
Total	483,773	479,994

4 Methods to Calculate GHG Emissions Inventory

4.1 On-road Transportation

The emissions associated with on-road transportation in Encinitas were estimated based on the vehicle miles traveled (VMT) and the average vehicle emission rate in the San Diego region in a given year. VMT data were provided by SANDAG based on its activity-based model and the Origin-Destination (O-D) method.⁶ The O-D VMT method is the preferred method proposed by the U.S Community Protocol that estimates miles traveled based on where a trip originates and where it ends to better attribute on-road emissions to cities and regions over miles traveled (Figure 2).⁷

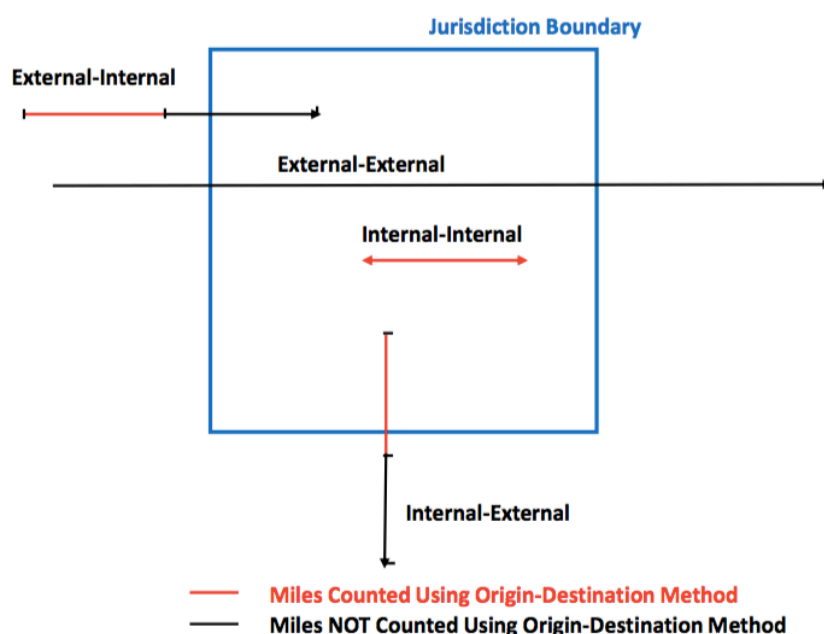


Figure 2 Components of Origin Destination (O-D) Method for Vehicle Miles Traveled Calculation

O-D VMT data include trips that originate and end within the boundary, in this case within Encinitas city boundary (referred to as Internal-Internal), and half of the trips that either begin within the boundary and end outside the boundary (referred to as Internal-External) or vice versa (referred to as External-Internal). VMT from trips that begin and end outside the designed boundary that only pass through Encinitas (referred to as External-External) were not included in the total city VMT. O-D VMT data for each trip type in 2012 were provided by SANDAG (Table 4).⁸

⁶ SANDAG activity-based model.

<http://www.sandag.org/index.asp?subclassid=120&fuseaction=home.subclasshome>

⁷ ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix D: Transportation and Other Mobile Emission Activities and Sources.

⁸ The 2012, 2014, 2020, 2030, 2035 and 2050 VMT data were provided by SANDAG to EPIC (March 2017).

Table 4 Original-Destination (O-D) VMT and Trip Types (Encinitas, 2012)

Trip Type	VMT (miles/weekday)
Internal-Internal	199,830
External-Internal/Internal-External	2,673,539

The Internal- External and External-Internal miles are divided by two to allocate the miles to Encinitas and outside jurisdictions. The total VMT is multiplied by 0.96 to adjust from average weekday VMT to average daily VMT, including weekends.⁹

The average vehicle emission rate expressed in carbon-dioxide equivalent per mile driven (g CO₂e/mile) was derived from the statewide mobile source emissions inventory EMFAC2014, developed by California Air Resources Board (ARB).¹⁰ EMFAC2014 was used to generate the GHG emission rate for the San Diego region, including all vehicle classes, model years, speeds, and fuel types.¹¹ The average emission rate (g CO₂e/mile) was calculated based on the distribution of VMT for each vehicle class and its emission rate. The average vehicle emission rate was adjusted from g CO₂/mile to g CO₂e/mile, to account for total greenhouse gas emissions including CO₂, CH₄ and N₂O.¹²

The total VMT, average vehicle emission rate, and corresponding GHG emissions from the on-road transportation category in 2012 and 2013 are given in Table 5.¹³

Table 5 VMT, Average Vehicle Emission Rate and GHG Emissions from On-road Transportation Category (Encinitas, 2012 and 2013)

Year	Average Vehicle Emissions Rate (g CO₂e/mile)	Total VMT (miles/day)	GHG Emissions (MT CO₂e)
2012	483	1,475,136	260,127
2013	476	1,469,679	255,362

⁹ The “5 to 7 day conversion” factor for VMT for freeways and highways was provided through SANDAG by Caltrans, Kim Sturmer (2009).

¹⁰ California Air Resources Board. Mobile Source Emissions Inventory. EMFAC2014 (2015).

<http://www.arb.ca.gov/msei/msei.htm>

¹¹ EMFAC2014 Web Database. Emission Rates for SANDAG. Download Date: 01/22/2016

<http://www.arb.ca.gov/emfac/2014/> The vehicle classes in EMFAC2014 are the same as the vehicle classes in previous model EMFAC2011.

¹² The conversion factor, 1.01, was calculated based on the ratio of CO₂ emissions to total greenhouse gas emissions (CO₂, CH₄ and N₂O expressed as CO₂e) using methods from EPA GHG Equivalencies Calculations and References (<http://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references>). Emissions were from mobile fossil fuel combustion in the transportation end-use category in 2013 (the latest available data year), on-road emissions. EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. (2015). Table 3-12 to 3-14. <http://www3.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>

¹³The 2013 total VMT are interpolated linearly based on 2012 and 2020 VMT.

Total VMT in Encinitas decreased less than 1% from 2012 to 2013; however, the GHG emissions from on-road transportation category decreased 2% from 2012 to 2013 due to the vehicle fleet turnover rate in the San Diego region and higher vehicle emission standards for new vehicles.

Figure 3 gives the breakdown of emissions by vehicle class in 2012, based on the EMFAC vehicle class distribution in the San Diego region, assuming Encinitas has the same distribution of vehicle types as the region. Passenger cars contribute most to emissions with 37%, while motorcycles contribute the least with 0.3%.¹⁴

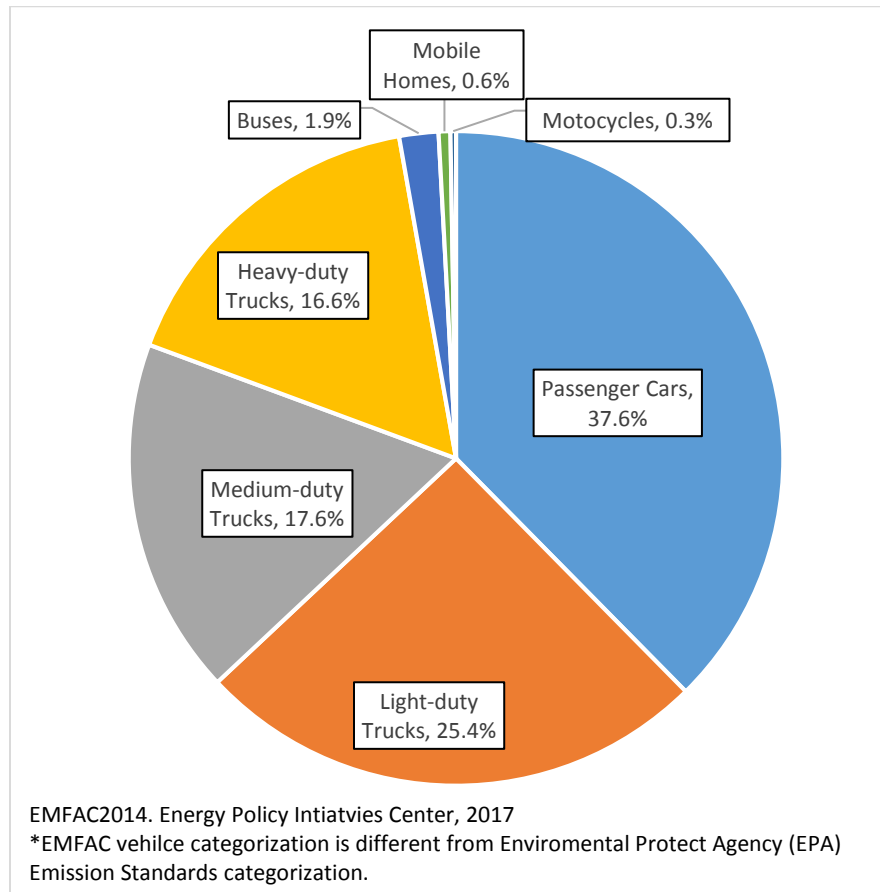


Figure 3 On-Road Transportation Emissions by Vehicle Class (Encinitas, 2012)

¹⁴ In EMFAC2014, passenger cars are all cars and fuel types designated as LDA. LDTs are light duty trucks divided into LDT1 and LDT2, where LDT1 includes gas, diesel, and electric fuel vehicles, while LDT2 does not include electric vehicles. Medium-duty trucks included medium duty vehicle (MDV with Gross Vehicle Weight Rating (GVWR) 5751-8,500 lbs), and heavy-duty trucks (HDTs), with GVWR larger than 8,500 lbs.

<http://www.arb.ca.gov/msei/modeling.htm> EMFAC uses a more detailed vehicle categorization in its database than the EPA Emission Standard categories. Vehicles with GVWR under 8,500 lbs are considered as light-duty trucks/vehicles under EPA Emission Standard category. <https://www.epa.gov/emission-standards-reference-guide>

4.2 Electricity

Emissions from electricity use in Encinitas were estimated using the Built Environment (BE.2) method from the U.S. Community Protocol.¹⁵ Annual electricity use data for Encinitas were provided by the local utility, San Diego Gas & Electric (SDG&E), for two customer classes: residential and combined commercial/industrial.¹⁶ The annual electricity use was adjusted using a loss factor¹⁷ of 1.067¹⁸ to account for transmission and distribution losses.

Annual electricity use was multiplied by the corresponding electricity emission factor for the SDG&E service territory, given in Table 6, expressed in pounds of CO₂e per megawatt-hour (lbs CO₂e/MWh). For a given year, the emission factor for the SDG&E service territory was developed based on the specific power mix of bundled power¹⁹ (MWh) and Direct Access power²⁰ (MWh), and their respective emission factors (lbs CO₂e/MWh). The SDG&E bundled emission factors are calculated using Federal Energy Regulatory Commission (FERC) Form 1²¹ data and the California Energy Commission (CEC) Power Source Disclosure Program²² data on SDG&E owned and purchased power, and U.S. EPA Emissions and Generating Resource Integrated Database (eGRID)²³ on specific power plant emissions. The Direct Access emission factor is calculated based on CPUC Decision D.14-12-037.²⁴

The differences in the electricity emission factors over the years reflect the change in the electricity power mix in the entire SDG&E service territory. The emission factors in 2012 and 2013 are higher than in previous years due to the shut-down in 2012 of the zero-emissions electricity supply from the San Onofre Nuclear Generation Station (SONGS). The SONGS electricity supply was replaced by other natural gas-fired power plant sources²⁵ that resulted in a temporary increase in the emission factors.

¹⁵ ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix C: Built Environment Emission Activities and Sources.

¹⁶ 2010-2013 electricity data were provided by SDG&E to EPIC in August 2014.

¹⁷ The transmission and distribution loss factor is used to scale end-use demand or retail sales to produce net energy for load. L. Wong. *A review of transmission losses in planning studies*. CEC Staff Paper. (2011)

<http://www.energy.ca.gov/2011publications/CEC-200-2011-009/CEC-200-2011-009.pdf>

¹⁸ California Energy Commission (CEC). *California Energy Demand 2015-2025 Final Forecast Mid-Case Final Baseline Demand Forecast Forms*. SDG&E Mid. The transmission and distribution loss factor is calculated based on the ratio of net energy for load (total sales + net losses) and total sales from SDG&E Form 1.2 Mid.

http://www.energy.ca.gov/2014_energy/policy/documents/demand_forecast_cm/Mid_Case/ Download Date: 06/23/15.

¹⁹ SDG&E bundled power includes the electricity from SDG&E owned power plants and the electricity from its net procurements.

²⁰ The Direct Access Program includes the electricity that customers purchased from non-SDG&E electric service providers (ESPs) but SDG&E provides transmission and distribution services. <http://www.sdge.com/customer-choice/electricity/direct-access-faq>

²¹ Federal Energy Regulatory Commission (FERC). Form 1- Electricity Utility Annual Report.

<http://www.ferc.gov/docs-filing/forms/form-1/viewer-instruct.asp>. Download Date: 07/20/2015

²² California Energy Commission (CEC) Power Source Disclosure Program under Senate Bill 1305.

<http://www.energy.ca.gov/sb1305/> Obtained from SDG&E's annual report, 2010-2014, from CEC staff on 08/07/2015.

²³ U.S. EPA. eGRID 2012. (2015) <http://www2.epa.gov/energy/egrid> Download Date: 10/09/2015

²⁴ Decision 14-12-037, December 18, 2014 in Rulemaking 11-03-012 (Filed March 24, 2011).

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M144/K130/144130487.pdf>

²⁵ SONGS is partially owned by SDG&E and historically accounted for approximately 15-20% of SDG&E power generation. SONGS was permanently closed in 2013 and the energy generation was replaced by other sources,

The total electricity use, electricity emission factor, and corresponding GHG emissions from the electricity category in 2012 and 2013 are given in Table 6.²⁶

Table 6 Electricity Use, Emission Factor and GHG Emissions from Electricity Category (Encinitas, 2012 and 2013)

Year	Electricity Use (MWh)	Emission Factor (lbs CO ₂ e/MWh)	GHG Emissions (MT CO ₂ e)
2012	328,110	763	113,556
2013	323,978	747	109,774

Electricity delivered by SDG&E to Encinitas decreased 1% from 2012 to 2013; however, the GHG emissions from the electricity category decreased 3% from 2012 to 2013 due to the increase in renewable content in the electricity supply.

The emissions can be broken down further into residential and commercial/industrial customer class. In 2012, 48% of emissions were attributed to commercial/industrial electricity use, while 52% came from residential electricity use, as shown in Figure 4.

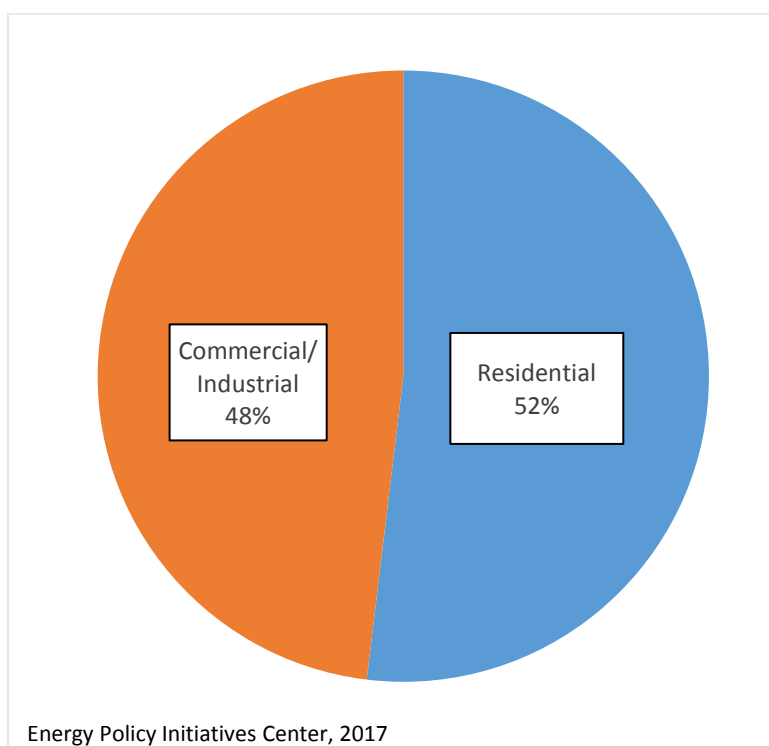


Figure 4 Electricity Emissions by Customer Class (Encinitas, 2012)

including non-renewable sources, which increased the emission factor of SDG&E-generated electricity.

<https://www.sdge.com/sites/default/files/documents/1390903853/2011%20Power%20Content%20Label.pdf>

²⁶ The total electricity use was modified to avoid double counting the electricity consumption associated with water treatment and distribution within the community boundary, which is addressed in the water category.

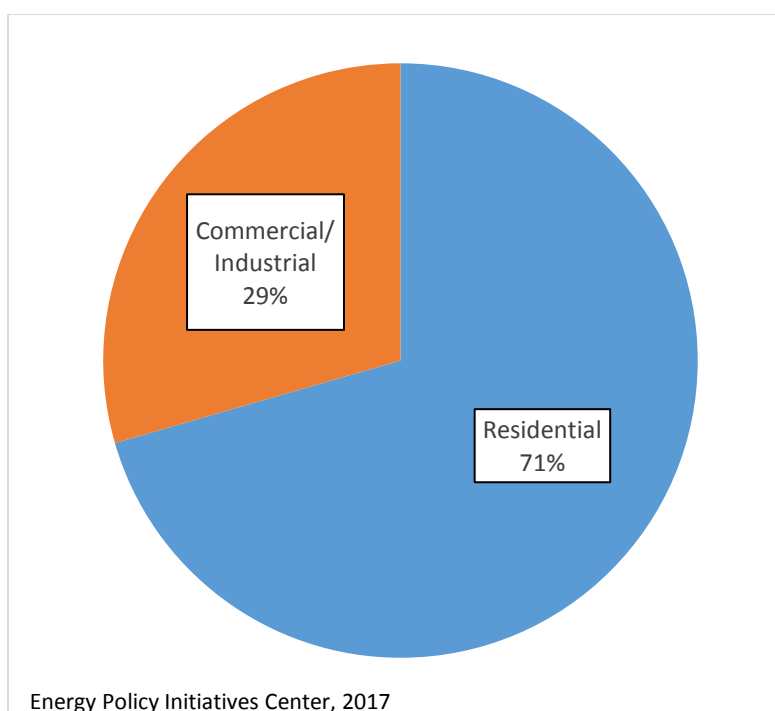
4.3 Natural Gas

Emissions from natural gas end-use applications in Encinitas were estimated using method Built Environment (BE.1) from the U.S Community Protocol.²⁷ Annual natural gas use was provided by SDG&E for two customer classes: residential and combined commercial/industrial.²⁸ To estimate emissions from the combustion of natural gas, fuel use was multiplied by an emission factor for natural gas based on data from the California Air Resources Board (ARB).²⁹ The total natural gas use, natural gas emission factors, and corresponding the GHG emissions from the natural gas category in 2012 and 2013 are given in Table 7.

Table 7 Natural Gas Use and GHG Emissions from Natural Gas Category (Encinitas, 2012 and 2013)

Year	Natural Gas Consumption (MMTherms)	GHG Emissions (MT CO ₂ e)
2012	11.3	62,027
2013	11.9	65,173

Emissions from the natural gas category can be broken down further into residential and commercial/industrial customer classes. In 2012, 29% of emissions resulted from commercial/industrial natural gas use, and the remaining 71% from residential natural gas use, as shown in Figure 5.



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Figure 5 Natural Gas Emissions by Customer Class (Encinitas, 2012)

²⁷ ICLEI– Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix C: Built Environment Emission Activities and Sources.

²⁸ 2010-2013 natural gas use data are provided by SDG&E to EPIC in August 2014.

²⁹ Emission factor for natural gas: 0.0554 MMT CO₂e/MM Therms. California Air Resources Board (ARB). Documentation of California's 2000-2013 GHG Inventory – Index.

http://www.arb.ca.gov/cc/inventory/doc/doc_index.php. Download Date: 08/11/2015

4.4 Solid Waste

Emissions from solid waste disposed by Encinitas were estimated using method Solid Waste (SW.4) from the U.S. Community Protocol.³⁰ This method uses waste disposed by a city in a given year multiplied by an emission factor for mixed solid waste³¹ from the ICLEI Community Protocol to estimate emissions from solid waste disposal. Solid waste disposal data were from the California Department of Resources Recycling and Recovery (CalRecycle) Disposal Reporting System (DRS).³² The default capture rate of methane emissions from landfills is 75% based on the U.S. Community Protocol. The total and per capita solid waste disposal and the corresponding GHG emissions from solid waste disposal in 2012 and 2013 are given in Table 8.

Table 8 Solid Waste Disposal and GHG Emissions from Solid Waste Category (Encinitas, 2012 and 2013)

Year	Solid Waste Disposal (metric tons/year)	Per Capita Solid Waste Disposal (pounds/person/day)	GHG Emissions (MT CO ₂ e)
2012	55,980	5.6	20,826
2013	59,885	6.0	22,279

Encinitas has one closed landfill in the city boundary: the Encinitas Landfill. Emissions from the closed landfill were included using method SW.1 Methane Emissions from Landfills in the ICLEI Community Protocol. This landfill no longer accepts waste but has emissions from the existing waste-in-place. The total emissions from the solid waste category, including emissions from waste disposal and the closed landfill, are given in Table 9.³³

Table 9 GHG Emissions from Solid Waste Category (Encinitas, 2012 and 2013)

Year	Emissions from Waste Disposal (MT CO ₂ e)	Emissions from In-boundary Closed Landfills (MT CO ₂ e)	GHG Emissions (MT CO ₂ e)
2012	20,826	1,645	22,471
2013	22,279	1,613	23,892

³⁰ ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix E. Solid Waste Emission Activities and Sources.

³¹ ICLEI Community protocol. Appendix E. Table SW.5 CH₄ Yield for Solid Waste Components.

<http://icleiusa.org/tools/ghg-protocols>

³² CalRecycle. Disposal Reporting System (DRS): Jurisdiction Disposal and Alternative Daily Cover (ADC) Tons by Facility. <http://www.calrecycle.ca.gov/LGCentral/Reports/DRS/Destination/JurDspFa.aspx>

³³ Waste-in-place emissions were obtained from the Encinitas 2010 ICLEI GHG Inventory Master Data Workbook (2012) provided by city staff in 2015.

4.5 Water

Emissions from water use in Encinitas were estimated using method Wastewater and Water (WW.14) from the U.S. Community Protocol.³⁴ The method considers each segment of the water system (upstream supply and conveyance, water treatment and local water distribution) individually, using the energy intensity per unit of water for each segment of the water system, given in Table 10.

Table 10 Energy Intensity for Each Segment of Water System

Segment of Water System	Energy Intensity (kWh/Million Gallons)
Upstream Supply and Conveyance ³⁵	9,727
Conventional Water Treatment ³⁶	684
Local Water Distribution ³⁷	292

The potable and recycled water supplied to Encinitas was provided by the Olivenhain Municipal Water District (OMWD) and the San Dieguito Water District (SDWD). Based on the Urban Water Management Plan for OMWD, its water suppliers include imported raw and treated water from the San Diego County Water Authority (SDCWA), recycled water from its 4S Ranch Water Reclamation Facility (4S WRF) and recycled water purchased from neighborhood agencies.³⁸ The raw water OMWD purchased from SDCWA is treated at its David C. McCollom Water Treatment Plant (DCMWTP). Based on the Urban Water Management Plan for SDWD, its water supply includes a mix of purchased untreated water from SDCWA, local surface water runoff, and recycled water purchased from the San Elijo Water Reclamation Facility (SEWRF). The raw water SDWD purchases from SDCWA and local surface water supply are treated at the R.E Badger Filtration Plant.³⁹ Only surface water and recycled water are supplied to Encinitas; no groundwater is supplied. Total potable and recycled water was provided by OMWD and SDWD, as shown in Table 11.

Table 11 Potable and Recycled Water Supplied (Encinitas, 2012 and 2013)

Year	Potable Water Supplied (Million Gallons)	Recycled Water Supplied (Million Gallons)
2012	3,854	215
2013	3,984	247

³⁴ ICLEI – Local Governments for Sustainability USA. U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Version 1.0. (2012). Appendix F. Wastewater and Water Emission Activities and Sources.

³⁵ California Energy Commission (CEC). Navigant, *Refining Estimates of Water-Related Energy Use in California*. 2006

³⁶ Conventional water treatment processes include coagulation/flocculation, sedimentation, filtration and disinfection. The energy intensity of standard treatment was calculated based on data from the City of San Diego's three Water Treatment Plants, provided to EPIC in 2014. (Value for 2010)

³⁷ City of San Diego provided to EPIC in 2014. (Value for 2010)

³⁸ Olivenhain Municipal Water District. 2010 Urban Water Management Plan. (Adopted June 22, 2011)

<https://www.olivenhain.com/files/docs/projects/UWMP/2010%20OMWD%20UWMP.pdf>

³⁹ San Dieguito Water District 2010 Urban Water Management Plan (Jun 2011).

<http://encinitasca.gov/index.aspx?page=201>

For upstream supply and conveyance emissions, the volume of potable water was multiplied by the upstream energy intensity to get the total electricity use from upstream conveyance. The electricity use was multiplied by the SDG&E service territory electricity emission factor (Table 6) for the GHG emissions. The electricity use and GHG emissions associated with upstream supply and conveyance are outside the city boundary and not included in the electricity category, and are therefore accounted for in the water category.

For water treatment emissions, the volume of potable water was multiplied by the water treatment energy intensity and SDG&E service territory electricity emission factor to obtain GHG emissions associated with water treatment. All water treatment plants are located outside the city boundary. Thus, the electricity use and GHG emissions associated with water treatment are not included in the electricity category, and are accounted for in the water category.

To determine emissions from local water distribution, all water supplied (potable and recycled water) was multiplied by the default energy intensity for distribution and the SDG&E service territory electricity emission factor. The electricity and GHG emissions associated with water distribution are within the city boundary and already captured in the electricity category. Therefore, the GHG emissions were deducted from the total electricity use in the electricity category to avoid double counting.

The total and per capita water supplied, as well as the corresponding GHG emissions from water category in 2012 and 2013, are given Table 12.⁴⁰

Table 12 Water Supplied and GHG Emissions from Water Category (Encinitas, 2012 and 2013)

Year	Total Water Supplied (Million Gallons)	Per Capita Water Supplied (gallons/person/day)	GHG Emissions (MT CO₂e)
2012	4,069	186	14,299
2013	4,232	192	14,474

In 2012, 91% of the GHG emissions in the water category were from upstream supply and conveyance. The breakdown of emissions for the water category is given in Figure 6. A significant amount of energy is associated with water consumed in the built environment. Those emissions are included in the electricity and natural gas emissions values, but data are not available to separate out those values.

⁴⁰ Total and per capita water supplied include both potable and recycled water.

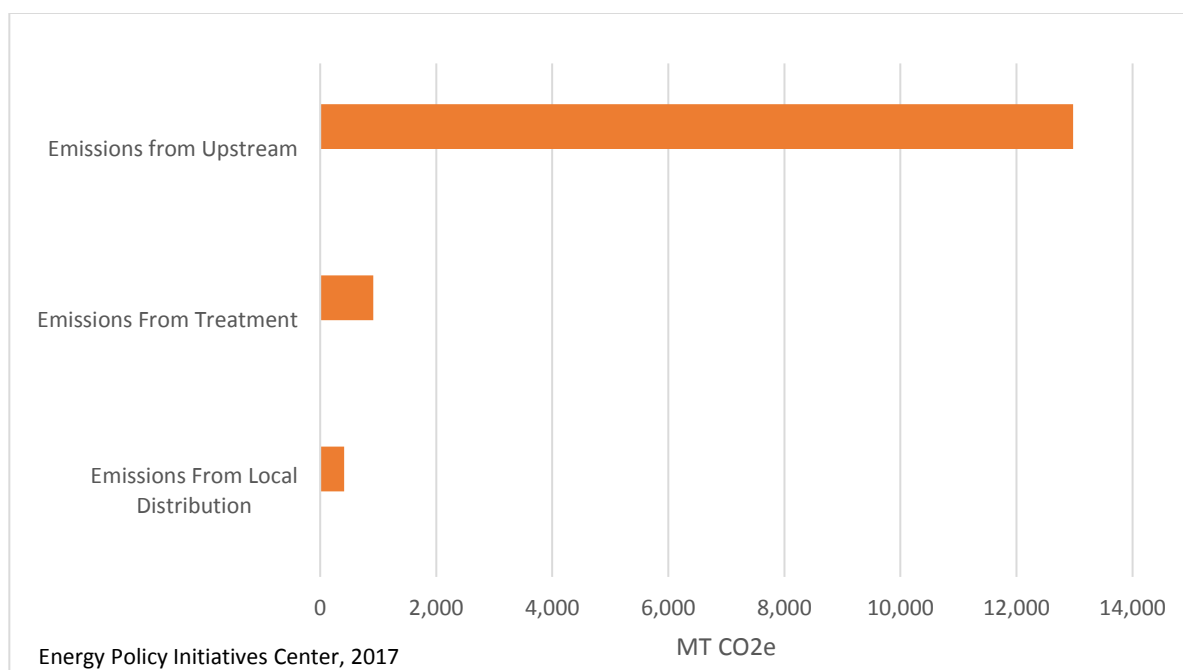


Figure 6 Water Supply Emissions by Water System Segment (Encinitas, 2012)

4.6 Off-road Transportation

The emissions from off-road transportation in Encinitas, such as gasoline and diesel fuel use for off-road vehicles and equipment, were estimated based on ARB off-road models. OFFROAD2007 is the main model for estimating off-road transportation emissions.⁴¹ After the release of OFFROAD2007, ARB has been developing inventories and models for each sub-category based on specific regulatory supports. For example, the recreational equipment category in OFFROAD2007 was replaced by RV2013.⁴² In this section, new inventories and models were used if available; otherwise, OFFROAD2007 was used.

Due to the lack of city-specific data from ARB models, the emissions or fuel consumption from the ARB model output for the San Diego region were scaled to Encinitas based on sub-category-specific scaling factors. The off-road activity sub-categories that are relevant to Encinitas and the scaling factors are given in Table 13.⁴³

⁴¹ ARB. Off-Road Motor Vehicles. OFFROAD 2007. <http://www.arb.ca.gov/msei/categories.htm>

⁴² ARB. Off-Road Gasoline-Fueled Equipment. Recreational Vehicles. RV2013 (Inventory Model Database). <http://www.arb.ca.gov/msei/categories.htm>

⁴³ The sub-categories listed in this table are not the comprehensive off-road mobile sources listed in ARB (<http://www.arb.ca.gov/msprog/offroad/offroad.htm>), as some of the sub-categories are not relevant to Encinitas, such as airport ground support, commercial marine vessels etc.

Table 13 Sub-categories included in the Off-road Transportation Categories

Sub-category	Model Source	Common Equipment Type	Scaling factor
Recreational Vehicles	RV2013	terrain vehicles, golf cars, minibikes, off-road motorcycles	Population
Lawn and Garden Equipment	OFFROAD2007	lawn mowers, trimmers, brush cutters, chainsaws, leaf blowers/ vacuums	Population
Pleasure Craft	OFFROAD2007	personal water craft, sailboats	Population
Light Commercial Equipment	OFFROAD2007	generator set, pumps, welders	Commercial Jobs

In the RV2013 model, the GHG emissions from recreational vehicles in the San Diego region were reported in tons/day and converted to annual emissions. For other sub-categories, the OFFROAD2007 model outputs are annual emissions for the San Diego region. The scaling factors and the corresponding GHG emissions from the off-road transportation category in 2012 and 2013 are given in Table 14.⁴⁴

Table 14 GHG Emissions from Off-road Transportation Category (Encinitas, 2012 and 2013)

Sub-category	Scaling Factor	San Diego Region (MMT CO ₂ e)		Encinitas (MT CO ₂ e)	
		2012	2013	2012	2013
Recreational Vehicles	1.9%	0.004	0.004	73	69
Lawn and Garden Equipment	1.9%	0.095	0.094	1,821	1,803
Pleasure Craft	1.9%	0.103	0.102	2,153	2,114
Light Commercial Equipment	2.1%	0.265	0.269	5,092	5,162
Total				9,138	9,149

4.7 Wastewater

The emissions from wastewater generation by Encinitas were estimated based on the total amount of wastewater generated in a given year and the emission factor of the wastewater treatment processes.

The wastewater in Encinitas is collected by the city's Wastewater Maintenance Section, including Encinitas Sanitary Division and the Cardiff Sanitary Division, and by Leucadia Wastewater District.⁴⁵ The wastewater collected is either delivered to Encina Wastewater Authority and treated at the Encina Water Pollution Control Facility (Encina WPCF) or delivered to and treated at the San Elijo Water Reclamation Facility (SEWRF). The Encinitas area wastewater flow data for the years 2013 and 2014 was provided by City staff, as shown in Table 15.

⁴⁴ The population scaling factors were calculated based on Encinitas 2012 and 2013 populations compared to the regional population. The regional population is from the SANDAG Demographic & Socio Economic Estimates (Updated in September 2015). Download Date: 10/29/2015. Regional commercial jobs in 2012 is from the SANDAG Series 13 Regional Growth Forecast (Updated in October 2013). Download Date: 03/29/2017. SANDAG Data Surfer. <http://datasurfer.sandag.org/> Commercial jobs include all employment types other than agriculture and mining, construction and manufacturing. Civilian Jobs estimate in 2013 is interpolated linearly based on 2012 and 2020 jobs estimates.

⁴⁵ City of Encinitas. Wastewater Maintenance Section. <http://www.cityofencinitas.org/index.aspx?page=191>

Table 15 Sewer Districts in Encinitas and Estimated Wastewater Flow

Sewer District	Wastewater Treatment Plant	Encinitas Service Area Flows (MGD)	Estimated Year
Encinitas Sanitation Division	Encina WPCF	1.0	2013
Cardiff Sanitary Division	SEWRF	1.4	2013
Leucadia Wastewater District	Encina WPCF	1.9	2014

The Leucadia component of wastewater flow was not available for 2013 but only for 2014. The wastewater flow collected through the Leucadia Wastewater District in 2014 was used as a proxy for 2013. The total estimated wastewater flow from Encinitas for treatment was the sum of flows collected by the three sewer districts, at 4.3 MGD (1,579 million gallons annually) in 2013. Due to the lack of data for the year 2012, wastewater flow in 2012 was estimated based on the per capita wastewater generation in 2013 (72 gallons/person/day) multiplied by the total population in 2012.

The wastewater treatment GHG emissions for Encina WPCF were provided by the Encina Wastewater Authority. In 2013, the Encina WPCF treated an average of 22.8 MGD with annual CO₂e emissions of 11,359 metric tons. This resulted in an emission factor of 1.37 MT CO₂e/million gallons treated which consists of emissions from: a) stationary combustion of anaerobic digester gas, b) process emissions from wastewater treatment with nitrification and denitrification, and c) direct anaerobic digester gas. The wastewater emission factor derived from Encina WPCF was applied to all wastewater flow in the City of Encinitas.⁴⁶ As similar data were not available for the other years, the emission factor was used as an estimate for both inventory years.

The total and per capita wastewater generated, as well as the corresponding GHG emissions from the wastewater category in 2012 and 2013, are given Table 16.

Table 16 Wastewater Generated and GHG Emissions from Wastewater Category (Encinitas, 2012 and 2013)

Year	Total Wastewater Generated (million gallons/year)	Per Capita Wastewater Generated (gallon/person/day)	GHG Emissions (MT CO₂e)
2012	1,573	72	2,155
2013	1,584	72	2,170

5 Business-as-usual (BAU) GHG Emissions Projection

GHG emissions inventories provide a historical view of emissions within a city; however, to plan for future GHG reduction opportunities, emissions are often projected using information about a city's anticipated growth and development but without additional changes to policy in the baseline year.

⁴⁶ EPIC was informed by SEWRF staff that the treatment processes in SEWRF is similar to Encina's WPCF and can be used a proxy.

Section 5.1 provides a summary of the Business-as-usual (BAU) emissions projections for 2020, 2030 and 2050, and Section 5.2 provides the projection method for each category.

5.1 Emissions Projection for 2020, 2030 and 2050

The total GHG emissions in 2020 are projected at 474,712 MT CO₂e, 2% lower than the 2012 emissions level. The total GHG emissions in 2030 are projected at 483,150 MT CO₂e, 0.1% lower than the 2012 emissions level. The total GHG emissions in 2050 are projected at 497,811 MT CO₂e, 3% higher than the 2012 emissions level. The change in emissions is mainly due to the changes in growth and development in each category. Figure 7 below shows a comparison of the emissions breakdown by category for the inventory years (2012 and 2013) and projection years (2020, 2030 and 2050).

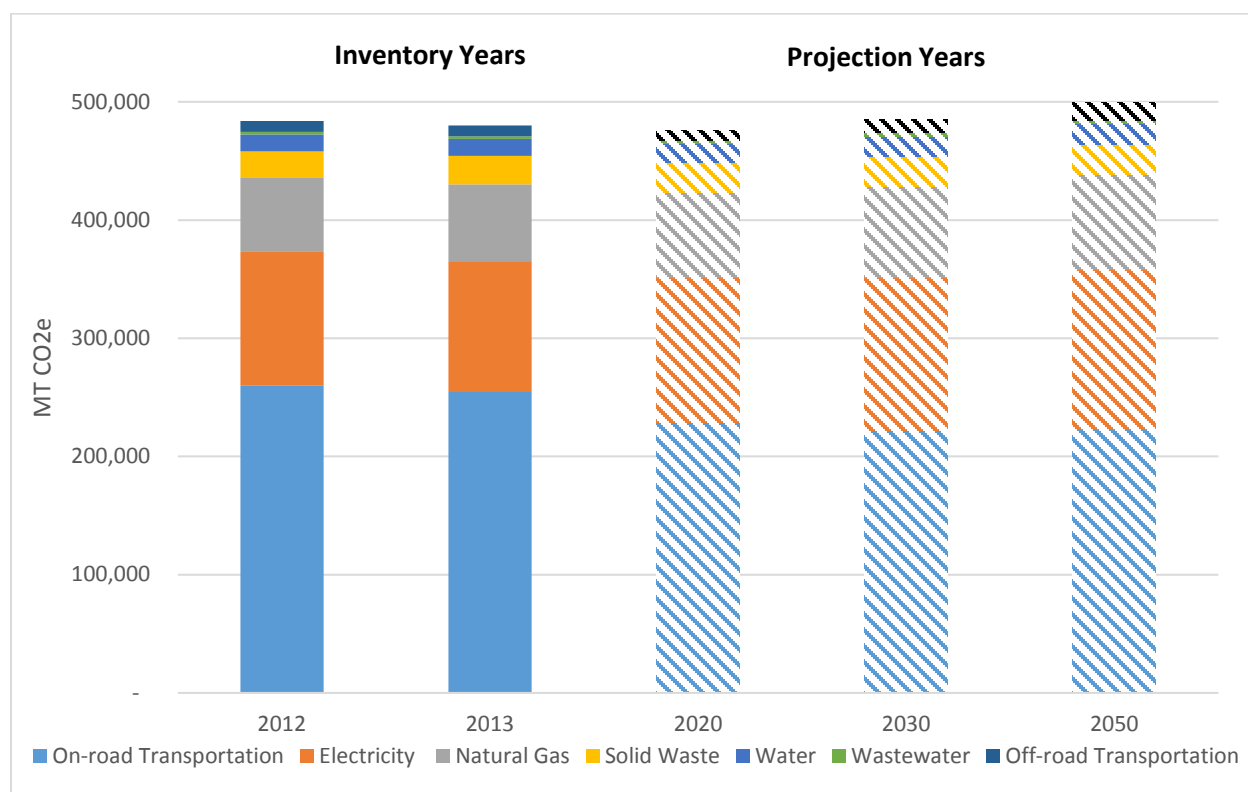


Figure 7 Business-as-usual GHG Emissions Projection (Encinitas, 2020, 2030 and 2050)

As show in Figure 7, the on-road transportation category still contributes the most to the overall emissions in each projection year. Emissions from on-road transportation are expected to decline through 2030 and then rise again through 2050, but not higher than the values in 2012 and 2013. The decline of on-road transportation emissions is due to the decline of average vehicle emission rates as more efficient new vehicles replace old vehicles in the region. The total and breakdown of projected emissions in each category are presented in

Table 17.

Table 17 Projected Total and Breakdown of GHG Emissions in Encinitas (2020, 2030 and 2050)

Year	Projected GHG Emissions (MT CO ₂ e)							
	On-road Transportation	Electricity	Natural Gas	Solid Waste	Water	Off-road Transportation	Wastewater	Total
2020	229,059	122,176	72,446	24,575	15,055	8,943	2,460	474,712
2030	221,787	129,680	77,062	25,014	15,541	11,441	2,625	483,150
2050	222,999	135,367	80,576	25,043	15,955	15,121	2,751	497,811

5.2 Methods to Project GHG Emissions

SANDAG's Series 13 Regional Growth Forecast was used to obtain the population and job growth in Encinitas, as shown in Table 2.⁴⁷ Each category was projected to future years separately using a method specifically for the category. For the categories not covered in the regional forecast, the latest year with available data is used for the projection.

5.2.1 On-road Transportation

Origin-Destination Vehicle Miles Traveled (O-D VMT) forecast data for each trip type for projection years 2020, 2030 and 2050 were provided by SANDAG based on its Series 13 activity-based model, as shown in Table 18.⁴⁸

Table 18 Projected Original-Destination (O-D) VMT and Trip Types (Encinitas, 2020, 2030 and 2050)

Trip Type (miles/weekday)	2020	2030	2050
Internal-Internal	198,878	202,635	210,983
Internal-External/External-Internal	2,651,929	2,709,144	2,707,472

To convert VMT of each type to total VMT, the same method as discussed in Section 4.1 is used here. The VMT was multiplied by the adjusted average vehicle emission rate derived from EMFAC2014 for each projection year. Two adjustments were made to the EMFAC2014 emission rate in addition to the method discussed in Section 4.1: 1) the electric vehicle penetration rate in 2012 was kept constant for all projection years⁴⁹, 2) for new vehicles entering the fleet after 2012, including all vehicle classes and fuel types, the emission rates are equal to the emission rates of new model year 2012 vehicles with the same vehicle class and fuel type.⁵⁰

The projected total VMT, average vehicle emission rates, and corresponding GHG emissions from on-road transportation category in 2012 and 2013 are given Table 19.

⁴⁷ SANDAG Series 13 Regional Growth Forecast (Updated in October 2013). Download Date: 12/06/2015. SANDAG Data Surfer. <http://datasurfer.sandag.org/>

⁴⁸ 2012, 2014, 2020, 2030, 2035 and 2050 VMT provided by SANDAG to EPIC (March 2017).

⁴⁹ Using a fixed electric vehicle penetration rate in 2012 avoids including the impact of the subsequent statewide ZEV (Zero Emission Vehicle) program on BAU emissions projection. The ZEV program requires auto manufacturers to make and sell ZEVs that will increase VMTs driven by ZEVs. The 2012 electric vehicle penetration rate is based on EMFAC2014 Technical Documentation. Section 3.2.2.4.3.

⁵⁰ This avoids the impact of other subsequently adopted federal and state vehicle efficiency standards for both light-duty and heavy-duty vehicles on BAU emissions projection.

Table 19 Projected VMT, Average Vehicle Emission Rate and GHG Emissions from On-road Transportation Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Total VMT (miles/day)	Average Vehicle Emission Rate (g CO₂e/mile)	Projected GHG Emissions (MT CO₂e)
2020	1,463,849	428.7	229,059
2030	1,494,919	406.5	221,787
2050	1,502,130	406.7	222,999

5.2.2 Electricity

Electricity use in the city was projected separately for the residential and commercial/industrial customer classes. For the residential customer class, the per capita electricity use in 2013 (2,591 kWh/person/year), the latest year with SDG&E data available, was calculated first by dividing the total electricity use in the residential class by the population in 2013. The per capita electricity use was held constant and used to project total electricity use for a future year by multiplying by the SANDAG Series 13 population projection for the future year. The projected total electricity use was multiplied by the SDG&E service territory electricity emission factor in 2013 of 747 lbs CO₂e/MWh, also held constant, for a projected total GHG emission. For the commercial/industrial class, a similar method was used. The total commercial/industrial electricity use was projected based on job growth and the per job electricity consumption in 2013 (5,632 kWh/job/year) for all future years. The total projected electricity use and corresponding GHG emissions from electricity category are given Table 20.

Table 20 Projected Electricity Use and GHG Emissions from Electricity Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Total Electricity Use (MWh)	Projected GHG Emissions (MT CO₂e)
2020	360,671	122,176
2030	382,826	129,680
2050	399,613	135,367

5.2.3 Natural Gas

The projection method for the natural gas category is similar to that for the electricity category, in that the residential and commercial/industrial classes are calculated separately. The per capita residential natural gas consumption (138 therms/person/year) and the per job natural gas consumption (135 therms/job/year) in 2013 were held constant with population and job growth for the projection. The natural gas emission factor used in Section 4.3 was held constant. The projected total natural gas use and corresponding GHG emissions from natural gas category are given in

Table 21.

Table 21 Projected Natural Gas Use and GHG Emissions from Natural Gas Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Total Natural Gas Use (MMTherms)	Projected GHG Emissions (MT CO ₂ e)
2020	13.2	72,446
2030	14.1	77,062
2050	14.7	80,576

5.2.4 Solid Waste

Solid waste disposal in Encinitas was projected using the population growth and the per capita solid waste disposed in 2013 (6 pounds/person/day), to be consistent with other categories. The projected emissions from the disposal were calculated by multiplying the disposal amount with the default emission factor for mixed solid waste provided in Section 4.4. The projected total waste disposal and corresponding GHG emissions from solid waste category are given in Table 22.

Table 22 Projected Solid Waste Disposal and GHG Emissions from Solid Waste Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Solid Waste Disposal (metric tons)	Projected GHG Emissions (MT CO ₂ e)
2020	62,287	24,575
2030	64,297	25,014
2050	66,012	25,043

5.2.5 Water

The total water use for all projection years was determined using the same method as in the above solid waste section, and was based on per capita water consumption and population growth. The per capita potable and recycled water use in 2013 were calculated separately. The per capita potable water supplied in 2013 was 180 gallons/person/day and per capita recycled water supplied was 11 gallons/person/day. The energy intensity for each element of the water cycle (Table 10) and the SDG&E service territory emission factor in 2013 were held constant for all projection years. The projected total water use and corresponding GHG emissions from the water category are given in Table 23.

Table 23 Projected Water Use and GHG Emissions from Water Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Potable and Recycled Water Supplied (million gallons)	Projected GHG Emissions (MT CO ₂ e)
2020	4,402	15,055
2030	4,544	15,541
2050	4,665	15,955

5.2.6 Off-road Transportation

In the off-road transportation category, the direct output of OFFROAD2007 for lawn and garden equipment, light commercial equipment, and pleasure craft sub-category for San Diego region were used and scaled down to Encinitas based on the scaling factor as determined in Section 4.6. The population scaling factor decreased to 1.7% in 2030 and 1.6% in 2050, and the commercial jobs scaling factor decreased to 1.8% in 2030 and 1.7% in 2050. For the recreational equipment sub-category, the RV2013 model does not include emissions output after 2035. For the projection years 2020 and 2030, the output for the San Diego region from the model was used and scaled down to Encinitas. For 2050, the emissions were estimated based on population growth. The projected total and sub-category off-road transportation emission are given Table 24.

Table 24 Projected GHG Emissions from Off-road Transportation Category (Encinitas, 2020, 2030 and 2050)

Year	Projected GHG Emissions (MT CO ₂ e)				
	Recreational Equipment	Lawn and Garden Equipment	Light Commercial Equipment	Pleasure Craft	Total
2020	89	1,602	1,869	5,383	8,943
2030	105	1,779	1,918	7,640	11,441
2050	112	1,977	1,908	11,123	15,121

5.2.7 Wastewater

The total wastewater generation for all projection years was determined using the same method as the solid waste and water sections, based on per capita wastewater generation and projected population growth. The per capita wastewater generation in 2013, the latest year with data available, was 72 gallons/person/year. The emission factor derived from data based on Encina Wastewater Authority (Section 4.7) was held constant for all projection years. The projected total water use and corresponding GHG emissions from the water category are given in Table 25.

Table 25 Projected Wastewater Generation and GHG Emissions from Wastewater Category (Encinitas, 2020, 2030 and 2050)

Year	Projected Wastewater Generation (million gallons)	Projected GHG Emissions (MT CO ₂ e)
2020	1,795	2,460
2030	1,916	2,625
2050	2,008	2,751

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Appendix B

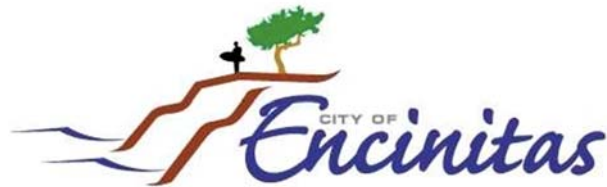
Greenhouse Gas Emissions Reduction Targets and Measures

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Methods for Estimating Greenhouse Gas Emissions Reduction from Encinitas Climate Action Plan

September 2017

Prepared for the City of Encinitas



Prepared by the Energy Policy Initiatives Center



About EPIC

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

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1 INTRODUCTION

This report provides a summary of the methods used to calculate greenhouse gas (GHG) emissions reductions for the strategies and actions included in the City of Encinitas (the City)'s Climate Action Plan (CAP).

Section 2 provides emission reduction targets for Encinitas in 2020 and 2030. Section 3 provides a summary of emission reduction potential in each emissions category from federal and state regulations and seven CAP strategies for the years 2020 and 2030. Section 4 provides the common data sources and methods used throughout the document. The detailed methods used to estimate emission reductions from each strategy and action are presented in Sections 5 and 6.

2 EMISSION REDUCTION TARGETS

The CAP baseline year is 2012 and the target emission levels are 13% below 2012 level by 2020 and 41% below 2012 level by 2030. The 2020 emission reduction target is consistent with the reduction the City would get from federal and state regulations. The 2030 target is consistent with the emissions reduction required for California statewide emissions to reach the 2030 target level using a 2012 baseline year.¹

Table 1 shows the business-as-usual (BAU) emissions projection, reduction targets, and reductions needed in 2020 and 2030 in metric tons of CO₂e (MT CO₂e).²

Table 1 Emissions Projection, Reduction Targets, and Emissions Reduction Needed

Year	Business-as-usual Emissions Projection (MT CO ₂ e)	Emission Reduction (% below baseline)	Target Emission Levels (MT CO ₂ e)	Emission Reduction Needed to Meet Target (MT CO ₂ e)
2012 (baseline)	483,773	-	-	-
2020	474,712	13%	421,481	53,232
2030	483,150	41%	285,426	197,724

3 SUMMARY OF EMISSIONS REDUCTION

This section summarizes the GHG emissions reduction from measures included in the City of Encinitas CAP. Table 2 presents a summary of emissions reduction potential from the 7 main CAP strategies and the federal and state regulations considered.

¹ Based on the California Air Resources Board's statewide inventory the 2012 statewide total GHG emissions level is at 448 million metric tons of CO₂e (MMT CO₂e).

https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2000-14.pdf In 2017 Climate Change Scoping Plan Update (Jan 2017 draft), the California statewide limit GHG emission level is 431 million metric tons of CO₂e (MMT CO₂e) in 2020 and 260 MMT CO₂e in 2030 (Figure I-1).

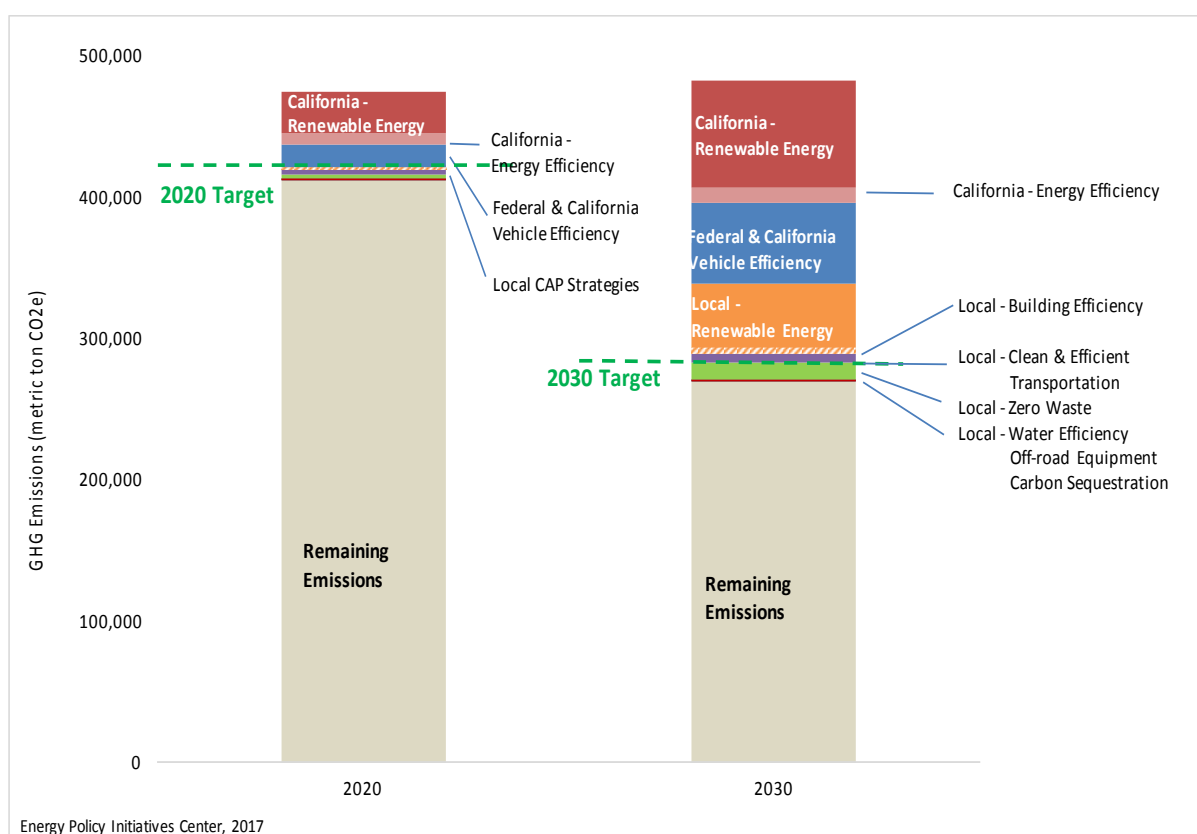
https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf At the state level, the emissions reduction target is equivalent to 4% below 2012 by 2020 and 41% below 2012 by 2030. The 2030 reduction target in the CAP is consistent with the state level reduction target in % below 2012 by 2030. The 2020 target in the CAP is more aggressive than the equivalent of statewide reduction target, in order to match the reduction that the City would get from the federal and state regulations.

² The method to project emissions at 2020 and 2030 is provided in the *City of Encinitas Greenhouse Gas Emissions Inventory and Projection* (EPIC, 2017).

Table 2 Summary of GHG Emissions Reduction Potential by Strategy in the Encinitas CAP

Year	Emissions Reduction from CAP Strategy (MT CO ₂ e)							Federal and State Regulations (MT CO ₂ e)	Total Emissions Reduction (MT CO ₂ e)
	Building Efficiency (BE)	Renewable Energy (RE)	Clean and Efficient Transportation (CET)	Water Efficiency (WE)	Zero Waste (ZW)	Reduce Off-road Equipment (OR)	Carbon Sequestration (CS)		
2020	941	434	4,481	712	2,830	128	5	53,232	62,764
2030	4,355	45,456	6,322	735	11,921	142	23	143,941	212,896

Figure 1 compares the relative contribution of each CAP strategy and federal and state regulation to the overall emissions reduction target in 2020 and 2030.

**Figure 1 Comparison of GHG Emission Reduction Potential by Strategy in the Encinitas CAP**

The green dashed lines in Figure 1 show the emissions target level in 2020 and 2030. In 2020, with only reduction from federal and state regulations, the target can be achieved. In 2030, significant reduction is needed from local strategies to reach the target. Renewable Energy (RE) will contribute the most to achieve the target in 2030. Considering current CAP strategies and federal and state regulations, the City is projected to reach both 2020 and 2030 targets.

Each CAP strategy comprises several quantifiable city actions and non-quantifiable supporting measures. Table 3 presents a detailed summary of the emissions reduction potential of each city action and each federal and state regulation and their contributions to the overall reduction.

Table 3 Summary of GHG Emissions Reduction by Action in the Encinitas CAP (MT CO₂e)

Emission Category	Federal, State Regulation and City Action	GHG Reduction (MT CO ₂ e)	
		2020	2030
Energy	City Actions		
	BE-1: Require energy audits of existing residential units	47	122
	BE-2: Require new single-family homes to install solar water heaters	130	1,241
	B3-3: Adopt higher energy efficiency standards for commercial buildings	98	220
	BE-4: Require commercial buildings to install solar water heaters	612	2,728
	MBE-1: Continue implementation of energy efficient projects in municipal facilities	54	44
	RE-1: Establish a Community Choice Energy program	-	43,644
	RE-2: Require new homes to install solar photovoltaic (PV) systems	141	614
	RE-3: Require commercial buildings to install solar photovoltaic (PV) systems	59	452
	MRE-1: Supply municipal facilities with onsite renewable energy	233	746
	Federal and State Regulations		
	SRE-1: California Renewables Portfolio Standard	22,628	54,555
	SRE-2: California Solar Programs and Policies	6,651	21,430
	SBE-1: California Energy Efficiency Programs	8,227	11,170
On-road Transportation	City Actions		
	CET-1: Complete and implement the Citywide Active Transportation Plan	Non-quantified	
	CET-2: Implement a local shuttle system	130	172
	CET-3: Improve traffic flow	3,671	2,839
	CET-4: Require residential electric vehicle charging stations	185	1,357
	CET-5: Require commercial electric vehicle charging stations	440	1,789
	MCET-1: Transition to efficient municipal fleet	55	166
	Federal and State Regulations		
	SCET-1: Federal and California Vehicle Efficiency Standards	15,725	56,786
Water	WE-1: Complete water rate study and implement new water rates	712	735
Waste	ZW-1: Implement a Zero Waste Program	2,830	11,921
Off-road Transportation	OR-1: Adopt a Leaf Blower Ordinance to limit use of 2-stroke leaf blowers	128	142
Carbon Sequestration	CS-1: Develop and implement an Urban Tree Planting program	5	23
	Total Reduction from Federal and State Regulations	53,232	143,941
	Total Reduction from City Actions	9,532	68,955
	Total Reduction (Federal, State and City)	62,764	212,896

Figure 2 provides a visualization of the emissions trend for the CAP horizon and estimated future trend through 2050. The City of Encinitas CAP does not include a GHG reduction target for 2050. Emissions beyond 2030 are included here to show future trends and potential reduction needed to reach the long-term target included in Executive Order S-3-05, which seeks to reduce statewide emissions 80% below 1990 levels.³

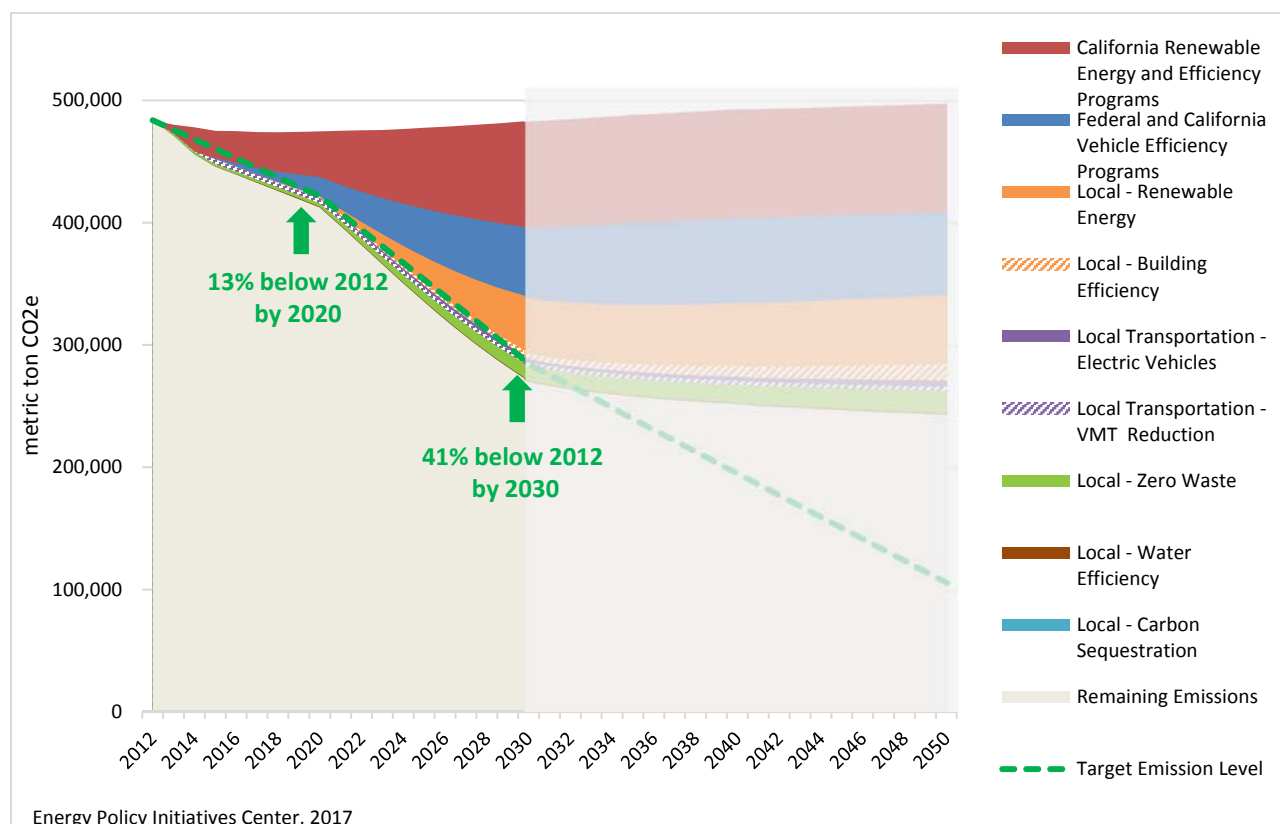


Figure 2 Encinitas GHG Emissions Trend (2012-2050)

In Figure 2, the BAU emissions projection is represented along the top of the graph. The green dashed line represents the target emission level. The colored wedges represent the reduction potential of each CAP strategy and of federal and state regulations. The bottom of the graph shows the remaining emissions after all the actions have taken place over time.

4 BACKGROUND AND COMMON ASSUMPTIONS

A set of common assumptions and sources was used to calculate potential emissions reduction for the strategies and actions included in the CAP. The following section provides assumptions that were applied to strategies related to electricity, natural gas, and on-road transportation. The detailed methods and data are provided in Sections 5 and 6.

4.1 Common Background Data

Table 4 presents a summary of common data EPIC used to estimate overall greenhouse gas emissions levels and the reduction estimates for each specific action.

³ Executive Order S-3-05. June 1, 2005. <https://www.gov.ca.gov/news.php?id=1861>

Table 4 Common Data for the Encinitas CAP

Data Category	2012	2020	2030
Population ⁴	60,057	62,908	64,938
Vehicle Miles Traveled (miles/day) ⁵	1,475,136	1,463,849	1,494,919
Gross Generation (GWh) ⁶	334	370	404
Housing Units (single-family) ⁷	20,699	21,192	21,366
Housing Units (multi-family)	4,111	4,178	4,504
Rentable Retail and Office Space (million square foot) ⁸	3.1	3.3	3.6

4.2 Electricity and Natural Gas Related Strategies

EPIC used the following assumptions and methods to calculate emissions reduction for electricity and natural gas related strategies, including federal and state regulations and city actions.

4.2.1 Greenhouse Gas Emission Factor for Electricity

The greenhouse gas emission factor for electricity, expressed in pounds of CO₂e per megawatt-hour (lbs CO₂e/MWh) is used in several ways throughout the CAP, including to determine the emissions from electricity category in the overall GHG emissions inventory and to estimate the effect of city actions and state programs in the CAP (i.e., increasing renewable electricity supply or reducing electricity use via building energy efficiency).

The emission factor includes electricity from three categories of supply: the utility (SDG&E), Community Choice Energy or similar program, and distributed solar PV systems. To estimate the emission factor, EPIC considers the amount of renewable content in and the percentage of overall energy use supplied by each category of supply. These two factors are used as weighting factors to develop an overall weighted average emission factor. The following sections describe the method to develop the weighted average emission factor. This method applies to the 2012 baseline year as well as each year in the CAP horizon. As the percentage of renewable supply in the mix increases, the weighted average emission factor of electricity supply decreases.

⁴ The 2012 population is from SANDAG's Demographic & Socio Economic Estimates (Updated in September, 2015). The population in 2020 and 2035 are from SANDAG's Series 13 Regional Growth Forecast (Updated in October 2013). Download Date: 12/09/2015. SANDAG Data Surfer. <http://datasurfer.sandag.org/>

⁵ SANDAG Origin-Destination VMT. VMT data were provided by SANDAG to EPIC in March 2017. VMT were converted to miles/day from miles/weekday using a "5 to 7 day conversion" as described in *City of Encinitas Greenhouse Gas Emissions Inventory and Projection* (EPIC, 2017).

⁶ Gross generation is the sum of the net energy for load, electricity from distributed solar PV systems, additional load from electric vehicles (EVs) and transmission and distribution losses. Baseline year PV generation is estimated using all SDG&E interconnected PV system capacities in the City.

⁷ Single-family and multi-family units are from SANDAG's Series 13 Regional Growth Forecast (Updated in October 2013). Download Date: 12/09/2015. SANDAG Data Surfer. <http://datasurfer.sandag.org/>

⁸ 2005-2009 rentable retail spaces in the Cardiff/Encinitas/Leucadia submarket and the 2005-2009 office space in the Solana Beach and Encinitas market are presented in Chapter 4 of the Current Conditions Report for the Encinitas General Plan Update (2010). The report was provided by the City to EPIC in March 2017. EPIC projected 2012-2030 rentable retail and offices spaces using the annual average growth rate from 2005-2009 of each commercial space type (0.4% for retail and 2.3% for office), and the ratio of the commercial and office land use in Solana Beach and Encinitas.

4.2.1.1 Utility (SDG&E) and Direct Access Providers

SDG&E's power mix includes electricity generated from SDG&E's own power plants and electricity procured by SDG&E (specified and unspecified sources).⁹ EPIC assumed SDG&E would meet the California Renewables Portfolio Standard (RPS), described in Section 5.1, with 33% renewable content by 2020 and 50% renewable content by 2030. We assumed that the electric service providers for Direct Access (DA) customers in the SDG&E service territory will also meet RPS requirements.

4.2.1.2 A Community Choice Energy (CCE) or Similar Program

CAP action RE-1 would present to City Council for consideration a Community Choice Energy (CCE) or similar program that increases the renewable electricity in the City. For this measure, EPIC assumed that the proposed CCE or similar program would launch in 2020 and supply its customers with electricity that has a 33% renewable content (i.e., RPS-compliant) and provide 100% renewable electricity supply by 2030. Details of RE-1, CCE or similar program, including the projected customer participation rate, are described in Section 6.2.1.

The CCE or similar program would use the existing SDG&E distribution and transmission system to supply the electricity. The renewable content in the CCE or similar program would affect the weighted average emission factor. By 2030, it would significantly affect the emission factor with 100% renewable content. Because the California RPS requires all California's electric service providers, including the CCE or similar program, to meet the requirements, a portion of the emissions reduction from the CCE or similar program associated with the 50% RPS requirement by 2030 is attributed to RPS compliance and is considered reduction from state regulations. The remaining reduction is attributed to city action RE-1.

4.2.1.3 Distributed Solar Photovoltaic (PV)

Electricity generation from distributed solar PV systems in the City, including residential and commercial PV systems, is considered part of the overall electricity supply. To estimate emissions reduction in the CAP, electricity generation from PV is assumed to be 100% renewable. State programs and city actions that contribute to increased distributed solar systems are described in Section 5.2 and Section 6.2.2 - 6.2.4.

Considering PV as a supply source rather than a reduction in grid supplied electricity does not affect the overall accounting of GHG emissions in the City of Encinitas – while it lowers the emissions factor it increases the total supply of electricity – but it does affect the weighted emissions factor that is used to estimate the emissions reductions for energy efficiency.

4.2.1.4 Weighted Average Emission Factor for Electricity

EPIC calculated the weighted average emission factor for electricity based on the percentage of gross generation supplied by each of the above three categories and the percentage of renewable content in each category.

Table 5 presents the contribution from each category to gross generation and overall renewable content, as well as the weighted average emission factor for 2020 and 2030.

⁹ A discussion of SDG&E power mix and baseline year 2012 emission factor is described in Section 4.2 of the *City of Encinitas Greenhouse Gas Emissions Inventory and Projection* (EPIC, 2017).

Table 5 Baseline & Projected Weighted Average Emission Factor for Electricity in Encinitas

Year	CCE or Similar Program		Utility		Solar PV		Citywide	
	% of Gross Generation Supplied	Renewable Content in Supply	% of Gross Generation Supplied	Renewable Content in Supply	% of Gross Generation Supplied	Renewable Content in Supply	Citywide Renewable	Weighted Average Emission Factor (lbs CO ₂ e/MWh)
2012	-	-	99%	19%	1%	100%	20%	739
2020	73%	33%	18%	33%	9%	100%	39%	562
2030	66%	100%	16%	50%	18%	100%	92%	76

In 2020, the projected electricity supply from distributed solar PV is expected to be 9% of gross generation. The CCE or similar program is projected to launch in 2020. Both CCE or similar program and SDG&E will supply 33% RPS-compliance renewables. In 2030, the projected electricity supply from PV reaches 18%.¹⁰ The renewable content in CCE or similar program increases to 100%, while the renewable content in SDG&E's electricity supply increases to 50% to comply with the 2030 RPS target.

EPIC used the weighted average emission factor to estimate the total reduction from measures that increases the renewable supply, including RPS (both utility and CCE or similar program), from CCE or similar program and from solar PV. The total reduction from measures to increase renewable supply is given in Table 6, calculated using gross generation and the difference between baseline 2012 emission factor and the weighted average emission factor in the target year.

Table 6 Emissions Reduction from Increasing Renewable Supply in Encinitas

Year	Gross Generation (GWh)	Baseline 2012 Emission Factor (lbs CO ₂ e/MWh)	Weighted Average Emission Factor (lbs CO ₂ e/MWh)	Emissions from Electricity using Baseline Emission Factor (MT CO ₂ e)	Emissions from Electricity using Weighted Average Emission Factor (MT CO ₂ e)	Total Emissions Reduction from Increasing Renewable Supply (MT CO ₂ e)
2012	334	739	739	112,053	112,053	-
2020	370	739	562	124,109	94,395	29,713
2030	404	739	76	135,424	13,983	121,441

4.2.2 GHG Emissions Reduction from Increasing Renewable Supply

The state's RPS requirements, CCE or similar program's above RPS requirements target, and distributed solar generation, all increase the Citywide renewable supply. As shown in Table 5, the projected Citywide renewable content in electricity would be 92% in 2030. To estimate the impact of each supply on increasing renewable electricity Citywide, EPIC allocated the total emissions reduction from increasing renewable supply (Table 6) to each supply category based the contribution of each category to citywide renewable electricity totals. The allocation is shown in Table 7.

Table 7 Allocation of Emissions Reductions from Increasing Renewable Supply in Encinitas

¹⁰ Detail to estimate solar capacity and electricity generation are described in Section 5.2.

Year	Electricity Supplier	Total	CEE or Similar Program	Utility	Solar PV
2020	Emissions Reduction from Increasing Renewable Supply (MT CO ₂ e)	29,713	18,103	4,526	7,085
	% of Gross Generation supplied by Renewable	39%	24%	6%	9%
2030	Emissions Reduction from Increasing Renewable Supply (MT CO ₂ e)	121,441	87,288	10,911	23,241
	% of Gross Generation supplied by Renewable	92%	66%	8%	18%

In Table 7, using 2020 as an example, the total GHG reduction from increasing renewable electricity supplies is 29,713 MT CO₂e. Overall in 2020, 39% of the gross generation is projected to be supplied by renewables, 24% by CCE or Similar Program renewable supply, 6% by the utility's renewable supply, and 8% by self-serve solar supply. Therefore, 61% (0.24/0.39) of the total emissions reduction from increasing renewable supply in 2020 (29,713 MT CO₂e) was allocated to the CCE or similar program accordingly (18,103 MT CO₂e). This same process was used to allocate the total emissions associated with increasing renewable electricity percentages for each electricity supplier for 2020 and 2030, as demonstrated in Table 7.

4.2.3 Greenhouse Gas Emission Factor for Natural Gas

For all state regulations and city actions related to natural gas, EPIC used the emission factor of 0.0054 metric tons CO₂e per therm¹¹ for all years to estimate emissions reduction potential from reducing natural gas use.

4.3 On-road Transportation Related Strategies

EPIC used the following assumptions to calculate emissions reductions for all CAP actions – federal, state, and city -- related to on-road transportation.

4.3.1 Greenhouse Gas Emission Factor for On-road Transportation

The emission factor for vehicle miles traveled, expressed in grams of carbon dioxide equivalent per mile (g CO₂e/mile), is used in several ways throughout the CAP, including to determine the emissions associated with on-road transportation for the overall inventory and to estimate the emissions impact of regulations and actions that affect both the rate of emissions (e.g., vehicle efficiency standards) and vehicle miles traveled (e.g., reduced commuter miles driven).

EPIC used the outputs of the California Air Resources Board's Mobile Source Emissions Inventory EMFAC2014 model to determine the average vehicle emission rates for the San Diego region.¹² The average vehicle emission rates for the San Diego region were used as proxy for the City. The EMFAC2014 model outputs include all key federal and state regulations related to tailpipe GHG emissions reduction

¹¹ ARB. 2014. Documentation of California's Greenhouse Gas Inventory. Fuel Combustion – Natural Gas. http://www.arb.ca.gov/cc/inventory/doc/docs1/1a1ai_instategenerationutilityowned_fuelcombustion_naturalgas_ch4_2013.htm

¹² EMFAC2014 <https://www.arb.ca.gov/emfac/2014/> EMFAC2014 is also the average vehicle emission rate source for the baseline year inventory and emissions projection as described in the *City of Encinitas Greenhouse Gas Emissions Inventory and Projection* (EPIC, 2017).

that were adopted before the model released date in 2015. The key federal and state regulations embedded in the outputs are:

- For passenger cars and light-duty vehicles - Federal Corporate Average Fuel Economy (CAFE) standards and California Advanced Clean Car (ACC) Program¹³
- For heavy-duty vehicles (heavy-duty trucks, tractors and buses) - U.S. EPA's Phase-I GHG Regulation and ARB Tractor-Trailer GHG Regulation¹⁴

The Low Carbon Fuel Standard (LCFS), which requires a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020, is not included in the EMFAC2014 model, because most of the emissions benefits come from the production aspect of the fuel cycle rather than the combustion cycle; therefore, the LCFS does not have a significant impact on the tailpipe GHG emissions reduction.¹⁵ In the previous version of the Mobile Source Emissions Inventory model, EMFAC2011, the emissions effects of the LCFS were incorporated into the model output.

Using the EMFAC2014 output, EPIC calculated the average vehicle emission rates (g CO₂/mile) based on the distribution of VMT for each vehicle class and its emission rate. We adjusted the results to convert from g CO₂/mile to g CO₂e/mile to account for total greenhouse gas emissions, including CO₂, CH₄, and N₂O.¹⁶ The average vehicle emission rates (Table 8) are used to estimate the GHG emissions reduction impact of policies to increase vehicle efficiency and increase zero emissions vehicles (ZEVs) on road.

Table 8 Average Vehicle Emission Rate (g CO₂e/mile) in the San Diego Region

Year	Average Vehicle Emission Rate - with the impact of all adopted policies (g CO ₂ e/mile)
2012	483
2020	398
2030	297

Because vehicle efficiency improves and the population of ZEVs increases over time, the average vehicle emission rate decreases. Therefore, actions to reduce VMT offset a smaller amount of GHG emissions over the CAP horizon.

¹³ The California Advanced Clean Cars (ACC) program include additional standards for vehicle model years 2017-2025, and the Zero Emission Vehicle (ZEV) program that requires manufactures to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles for 2017-2025 model year vehicles. EMFAC2014 Technical Documentation. Section 1.4 <https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>

¹⁴ EPA's Phase-I GHG regulation include GHG emission standards for heavy-duty vehicle model years 2014-2018. ARB's Tractor-Trailer GHG Regulation include the aerodynamic and tire improvements requirements to reduce GHG emissions from heavy-duty trucks. EMFAC2014 Technical Documentation. Section 1.4 <https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>

¹⁵ EMFAC2014 Technical Documentation. Section 1.4 <https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>

¹⁶ the calculation and adjustment method are described in Section 4.1 of the *City of Encinitas Greenhouse Gas Emissions Inventory and Projection* (EPIC, 2017).

4.3.2 GHG Emissions Reduction from Increasing Zero Emission Vehicles (ZEVs)

The CAP's Clean and Efficient Transportation Strategy includes a number of state programs and city actions: 1) state's Zero Emission Vehicle (ZEV) programs, which requires manufactures to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles, and 2) the proposed CET-4 and CET-5 under the to increase residential and commercial electric vehicle charging stations (details in Section 6.3.4 and Section 6.3.5) – that increase the number of ZEVs and the miles driven by ZEVs. To avoid double counting, EPIC set the maximum emissions related to all ZEV measures in the CAP at the amount expected from statewide programs and policies. Emissions associated with City actions were subtracted from the statewide total based of the number of vehicles affected by each policy.

To calculate the emissions reduction due to state's ZEV program, EPIC compared the emission rate with no policy impact after baseline year 2012 used for business-as-usual projection (fixed 2012 ZEV penetration rate for the CAP horizon) and the emission rate with the impact of ZEV program (EMFAC2014's default ZEV penetration rate). This approach is similar to the one used for the electric category emissions above. Note that with no policy actions after the baseline year, the average vehicle emission rate will decline due to the replacement of older, less efficient vehicles, with cleaner vehicles. Using this approach, total emission due to statewide programs would be 2,045 MT CO₂e in 2020 and 11,810 MT CO₂e in 2030.

To calculate the projected ZEVs associated with the statewide ZEV program, EPIC applied the ratio of miles driven by ZEVs and total vehicle miles region-wide to the total projected VMT in the City. This yields the total ZEVs miles in the City. This value was then converted to the number of ZEVs with the average miles driven by ZEV per day.¹⁷

To estimate the GHG emissions impact of CAP actions CET-4 and CET-5 (described in Section 6.3.4 and Section 6.3.5, EPIC allocated a portion of the statewide emissions reduction total based on the total number of ZEVs that would result from the local action. Table 9 provides the key assumptions and results of allocating GHG emissions reduction from increasing ZEVs to both city actions. For example, in 2020, CET-4 would lead to an additional 65 electric vehicles, which is about 9% of total projected ZEVs (65/718). Emissions allocated to CET-4 would be 185 MT CO₂e (9% of the total reduction of 2,045 CO₂e due to ZEV program).

Table 9 Allocation of GHG Emissions Reduction from Increasing Zero Emission Vehicles

Year	Average Vehicle Emission Rate (g CO ₂ e/mile)		Total Emission Reduction from increasing ZEVs (MT CO ₂ e)	Projected Number of ZEVs on Road	Projected ZEVs due to the impact of local actions		Emissions Reduction from ZEV allocated to local actions (MT CO ₂ e)	
	With no policy impact after baseline year 2012	With impact of adopted California ZEV program			CET-4	CET-5	CET-4	CET-5
2020	429	425	2,045	718	65	154	185	440
2030	406	385	11,810	3,251	374	492	1,357	1,789

¹⁷ Mile driven by ZEV per day was derived from EMFAC2014 EV VMT and number of EVs outputs for the San Diego region. The average, 35 miles/day, is the average from 2012-2030. % of miles driven by ZEV of total vehicles was derived for each year from 2012-2030 using EFAMC2014 EV VMT and total VMT.

There is a connection between electric vehicles and the emissions from the electric category. EPIC accounts for this connection and as the population of electric vehicles increases, the amount of electricity also increases. Additional electricity consumption is accounted for in the projected gross generation and associated emissions accrue to the electricity category.

4.4 Rounding of Values in Tables and Figures

Within the tables, charts, and figures found throughout the appendices, rounding of values is often required. Within the actual calculations, values are not rounded at intermediary steps to avoid introducing unnecessary error. As a result of rounding, some totals may not equal the values summed.

5 FEDERAL AND STATE REGULATIONS

Federal and state regulations are expected to reduce emissions significantly over the CAP time horizon. This section provides a summary of the methods used to estimate the emissions reduction associated with the following federal and state regulations to increase renewable energy (SRE), building efficiency (SBE), and clean and efficient transportation (SCET):

- SRE-1: California Renewables Portfolio Standard
- SRE-2: California Solar Programs and Policies
- SBE-1: California Energy Efficiency Programs
- SCET-1: Federal and California Vehicle Efficiency Standards

5.1 SRE-1: California Renewables Portfolio Standard

Signed into law in 2011, the Renewables Portfolio Standard (RPS) requires all of California's electric service providers to increase procurement from eligible renewable energy sources to 33% of total procurement by 2020.¹⁸ In 2015 Governor Brown signed into law SB 350, which increases renewable electricity targets to 50% by 2030.¹⁹ The emissions reduction estimates are based on these state policies: 33% renewable by 2020 and 50% renewable by 2030.

All electric service providers have to meet the RPS requirements including utility (SDG&E), electric service providers for SDG&E's DA customers, and CCE or similar program.

Estimates here assume that SDG&E would meet RPS requirements with a 33% renewable content in 2020 and a 50% renewable content in 2030.²⁰ For SDG&E's Direct Access (DA) customers, their electric service providers will also meet RPS requirements. EPIC assumed all electricity transmitted and distributed by SDG&E, including electricity provided to DA customers, will meet the RPS requirements for 2020 and 2030. For CCE or similar program, a portion of the emissions reduction from CCE or similar program will be attributed to RPS compliance and the remaining reduction to city action RE-1, as described in Section 6.2.1 and Table 20. Table 10 shows results from SRE-1, GHG emissions reduction is the result in year 2020 and 2030 only.

¹⁸ Senate Bill No. 2. http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0001-0050/sbx1_2_bill_20110412_chaptered.pdf.

¹⁹ Senate Bills 350 – Clean Energy and Pollution Reduction Act of 2015. https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350..

²⁰ SDG&E's power mix had 19.2% renewable in baseline year 2012. http://www.energy.ca.gov/pcl/labels/2012_labels/IOUs/San_Diego_Gas_and_Electric_2012.pdf In 2015, the latest year with data available as of March 2017, SDG&E had 35% renewable in the power mix, above the 2020 RPS target and on track to meet the 2030 RPS target. [http://www.energy.ca.gov/pcl/labels/2015_labels/San_Diego_Gas_and_Electric_\(SDGandE\).pdf](http://www.energy.ca.gov/pcl/labels/2015_labels/San_Diego_Gas_and_Electric_(SDGandE).pdf)

Table 10 Electric Service Providers and Emissions Reduction from SRE-1: California Renewables Portfolio Standard

Year	Emissions reduction from utility compliance with RPS (MT CO ₂ e)	Emissions reduction from CCE or similar program compliance with RPS (MT CO ₂ e)	Total emissions reduction from RPS (MT CO ₂ e)
2020	4,526	18,103	22,628
2030	10,911	43,644	54,555

5.2 SRE-2: California Solar Programs and Policies

California has several policies and programs to encourage customer-owned, distributed solar photovoltaic (PV) systems, including California Solar Initiatives, New Solar Home Partnership, Net Energy Metering, and electricity rate structures designed for solar customers.²¹

EPIC estimated the electricity generation and capacity of distributed solar PV systems in the City based on the solar generation in SDG&E service territory from 2012 to 2030, and ratio of solar generation in the City to that of SDG&E service territory.²² From 2012-2015, about 2.2% of all customer-owned and interconnected PV systems installed in the SDG&E service territory were located in the City.²³ The estimated capacity and electricity generation from PV systems in the City are given in Table 11.

Table 11 Estimated Encinitas Solar PV System Capacity and Electricity Generation

Year	PV Capacity (MW)	Electricity Generation (GWh)
2012	2.7	5
2020	19.8	35
2030	40.5	71

Several city actions under the CAP's Renewable Energy Strategy, including RE-2 (require PV on new homes, Section 6.2.2), RE-3 (require PV on commercial buildings, Section 6.2.3), and MRE-1 (Install PV systems on municipal facilities, Section 6.2.4) are likely associated with the State Solar Programs. For example, Encinitas homeowners might install PV systems under the proposed requirements of RE-2 and receive financial incentives from the New Solar Homes Partnership to reduce the upfront cost of the

²¹ SDG&E electricity rate for domestic time-of-use for households with a solar energy system (effective Mar 1, 2017). http://regarchive.sdge.com/tm2/pdf/ELEC_ELEC-SCHEDS_DR-SES.pdf

²² 2012-2027 SDG&E planning area solar PV self-generation electricity is from California Energy Commission 2017-2027 Energy Demand Forecast Mid Demand Case.

http://www.energy.ca.gov/2016_energypolicy/documents/2016-12-08_workshop/mid_demand_case.php EPIC used the 2020-2027 solar generation annual growth rate, 7.4%, to estimate 2028-2030 solar generation in the SDG&E planning area.

²³ Capacity of all interconnected PV system in Encinitas are from California Distributed Generation Statistics NEM Currently Interconnected Data Set (current as of May 31, 2016). <http://californiadgstats.ca.gov/downloads/> Capacity were converted to kWh using 20% capacity factor.

installation. To avoid double counting, similar to the treatment of emissions from ZEVs, EPIC set the maximum amount of GHG reductions equal to those associated with the state solar programs and policies. The method for estimating total GHG reduction from solar PV is presented in Section 4.2.1.3.

GHG reductions from local solar PV actions were subtracted from the statewide total. The amount of emissions allocated from state solar programs and policies to the above city actions is based on the estimated solar capacity in megawatts (MW) that would result from each city action, the remaining capacity and emissions reduction are attributed to SRE-1. The methods to estimate the solar capacity of each city actions are described in Section 6.2.2 - 6.2.4.

Table 12 summarizes the key assumptions and results of the allocation. In

Table 12, GHG emissions reductions are the result in year 2020 and 2030 only.

Table 12 Key Assumptions and Results for SRE-1: California Solar Programs

Year	State or City Action	Total	MRE-1	RE-2	RE-3	SRE-1 State Solar excluding city actions
2020	Projected Solar PV Capacity (MW)	19.8	0.7	0.4	0.2	18.6
	Emissions Reduction (MT CO ₂ e)	7,085	233	141	59	6,651
2030	Projected Solar PV Capacity (MW)	40.5	1.3	1.1	0.8	37.3
	Emissions Reduction (MT CO ₂ e)	23,241	746	614	452	21,430

5.3 SBE-1: California Energy Efficiency Programs

On October 16, 2014, the California Public Utilities Commission adopted Decision 14-10-046 in Rulemaking 13-11-005, which establishes electricity and natural gas reduction targets for the investor-owned utilities (IOUs) in California for 2015.²⁴ Navigant Consulting and team developed the 2015 and Beyond Potential and Goals Study to evaluate 2016-2024 energy savings in the IOU service areas under the direction provided by the CPUC rulemaking.²⁵ SDG&E administers the energy efficiency programs in the San Diego region. To determine the emissions reduction associated with the efficiency programs, EPIC estimated the energy saving potential of the program. The study breaks the overall energy efficiency goals into two categories: (1) rebate programs including behavior programs, and (2) net codes and standards IOU claimable savings (other than appliance and building standards).

To evaluate the impact of the energy efficiency program in the City, EPIC scaled the total estimated energy reduction in San Diego region (SDG&E service area) to the City using a ratio of the City's natural gas and electricity demand to those of the SDG&E service area. In the latest year with both SDG&E service area and Encinitas energy demand available, 2014, the ratios are 1.5% of the electricity and 3%

²⁴ CPUC. Decision establishing energy efficiency savings goals and approving 2015 energy efficiency programs and budgets. <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M129/K228/129228024.pdf>

²⁵ Navigant Consulting. (September 2015). Energy Efficiency Potential and Goals Study for 2015 and Beyond Stage 1 Final Report. <http://www.cpuc.ca.gov/General.aspx?id=6442452620> The 2015 study include adjustment for whole building savings to be consistent with CPUC D 14-10-046. The 2015 study is the latest study as of May 2017, the 2018 potential & goals study has not been released yet.

for natural gas.²⁶ Therefore, the electricity and natural gas savings were allocated accordingly.²⁷

Several city actions under the CAP's Building Efficiency Strategy, including BE-1 (require energy audits of residential units, Section 6.1.1) and MBE-1 (implement energy efficient projects in municipal facilities, Section 6.1.5), are likely associated with SBE-1. For example, Encinitas residents might perform energy audits for their houses' major renovations under the proposed requirement of BE-1, and use incentives from SDG&E's energy efficiency programs for the energy retrofits. To avoid double counting, EPIC subtracted out the electricity and natural gas saving and emissions reduction from BE-1 and MBE-1 from SBE-1.

Emissions reduction from annual electricity savings was calculated by multiplying the electricity saving and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction from energy efficiency program decreases accordingly. Similarly, emissions reduction from annual natural gas savings was calculated using natural gas saving and natural gas emission factor.

Emissions reduction from electricity and natural gas saving were summed to determine total emissions reduction. Table 13 summarizes the key assumptions and results. In Table 13, energy savings and GHG emissions reduction are the results in year 2020 and 2030 only.

Table 13 Key Assumptions and Results for SBE-1: California Energy Efficiency Programs

Year	Energy Savings		GHG Emissions Reduction		
	Electricity Reduction (GWh)	Natural Gas Reduction (million therm)	From Electricity Reduction (MT CO ₂ e)	From Natural Gas Reduction (MT CO ₂ e)	Total GHG Reduction (MT CO ₂ e)
2020	20	0.6	5,201	3,026	8,227
2030	55	1.7	1,916	9,254	11,170

5.4 SCET-1: Federal and California Vehicle Efficiency Standards

As discussed in Section 4.3.1, ARB's EMFAC2014 model includes all key federal and state regulations related to tailpipe GHG emissions reduction for both light-duty vehicles and heavy-duty vehicles that were adopted before the model released date in 2015. Table 8 shows the average vehicle emission rate with the impact of all policies on increasing vehicle efficiency and increasing ZEVs. The GHG emissions reduction in 2020 and 2030, without the impact of city actions on increasing ZEV, are given in Table 14). In Table 14, the average vehicle emission rates and GHG emissions reduction are results in year 2020 and 2030 only.

Table 14 Key Assumptions and Results for SCET-1: Federal and California Vehicle Efficiency Standards

²⁶ Based on the California Energy Commission's 2016-2026 Energy Demand Forecast, SDG&E service area net energy for load was 21542 GWh in 2014. http://www.energy.ca.gov/2015_energypolicy/documents/2016-01-27_mid_case_final_baseline_demand_forecast.php SDG&E natural gas sales was 39 billion cubic feet in 2014. <http://investor.shareholder.com/sre/secfiling.cfm?filingID=86521-17-17&CIK=86521> Electricity and natural gas use in Encinitas were provided by SDG&E to EPIC for the GHG inventory updates.

²⁷ SDG&E provided 2013 and 2014 San Diego north coast cities energy saving data, the energy saving from north coast cities allocated to Encinitas are 1.2 GWh and 8,000 therms in 2013, and 3.1 GWh and 35,000 therms in 2014. The saving were closed to the 2013 and 2014 savings EPIC estimated using the allocation method.

Year	Projected VMT (million miles/year)	Average Vehicle Emission Rate (g CO ₂ e/mile)		GHG Emissions Reduction (MT CO ₂ e)		
		With no policy impact after baseline year 2012	With all statewide adopted policy impact	from statewide policies to increase vehicle efficiency and ZEVs	from city actions to increase ZEVs	from SCET-1
2020	534	429	398	16,350	625	15,725
2030	546	406	297	59,932	3,146	56,786

6 CAP STRATEGIES AND CITY ACTIONS

The following section describes the methods used to estimate the GHG reductions from city actions, which are organized into the following seven main strategies:

- Building Efficiency (BE)
- Renewable Energy (RE)
- Clean and Efficient Transportations (CET)
- Water Efficiency (WE)
- Zero Waste (ZW)
- Reduce Off-Road Equipment (OR)
- Carbon Sequestration (CS)

Each strategy is supported by several quantifiable city actions and non-quantifiable supporting measures.

6.1 Building Efficiency (BE)

The goal of Building Efficiency strategy is to reduce residential, commercial, and municipal operation energy consumption.

6.1.1 BE-1: Require Energy Audits of Existing Residential Units

BE-1 would require all existing residential units in the City that seek building permits for modifications, alterations, and additions to perform energy audits. This city action is projected to start in 2018.

From 2012 to 2015, on average the City issued 197 building permits per year for residential retrofits and additions.²⁸ The number of housing units (single-family and multi-family) in the City was 24,810 in 2012, based on SANDAG Series 13 Regional Growth Forecast. Approximately 1% of the housing units would be required to perform energy audits under BE-1 every year. To avoid double counting, EPIC assumed the existing housing units would only be retrofitted or added once within the CAP horizon. A total of 3% by 2020 and 12% by 2030 of the existing housing units since 2012 would be affected by this action.

Best practice indicates that about 12% of units that complete energy audits would perform energy retrofits and implement energy efficiency activities.²⁹ The average energy (electricity and natural gas)

²⁸ 2012-2015 number of building permits issued for new, retrofit and addition were provided by City planning and building department to EPIC in April 2017.

²⁹ ACEEE. (2011) Austin Energy Conservation Audit and Disclosure.

<http://docketpublic.energy.ca.gov/PublicDocuments/Migration-12-22-2015/Non-Regulatory/12-AB1103->

saving per retrofit, under Energy Upgrade California – San Diego program, is approximately 15% of average household electricity and natural gas consumption.³⁰

Emissions reduction from annual electricity saving was calculated by multiplying the number of retrofits, average electricity reduction per retrofit, and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction from energy retrofits decreases accordingly. Similarly, emissions reduction from annual natural gas saving was calculated by multiplying the number of retrofits, average natural gas reduction per retrofit, and natural gas emission factor. Emissions reduction from electricity and natural gas saving were summed to determine total emissions reduction. Table 15 summarizes the key assumptions and results. In Table 15, energy savings and GHG emissions reduction are the savings and reduction in year 2020 and 2030 only.

Table 15 Key Assumptions and Results for BE-1: Require Energy Audits of Existing Residential Units

Year	Number of Housing Units Affected				Energy Saving		GHG Emissions Reduction		
	% of units affected annually	% of all existing units affected after 2012	Units completing energy audits after 2012	Units implementing energy retrofits after 2012	Electricity Reduction (kWh)	Natural gas Reduction (therm)	from electricity reduction (MT CO ₂ e)	from natural gas saving reduction (MT CO ₂ e)	Total GHG Reduction (MT CO ₂ e)
2020	1%	3%	717	77	85,462	4,552	22	25	47
2030	1%	12%	3,028	327	375,239	19,987	13	109	122

6.1.2 BE-2: Require New Single-Family Homes to Install Solar Water Heaters

BE-2 would require all new single-family homes starting in 2018 to install solar water heaters (SWHs) or other efficiency technology, unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

EPIC estimated the annual new single-family homes constructed in the City based the difference between the projected units in the current year and previous year in SANDAG Series 13 Regional Growth Forecast.³¹ For a single-family home in the San Diego region, the average energy reduction per unit for replacing an electric water heater with a SHW is 2,839 kWh, and the average reduction per unit for

[1/2012/TN%2068669%2011-26-12%20Case%20Study%20-%20Austin%20Energy%20Conservation%20Audit%20and%20Disclosure%20\(ECAD\)%20Ordinance.pdf](http://www.energy.ca.gov/2014publications/CEC-400-2014-014/CEC-400-2014-014.pdf)

³⁰ DKV KEMA Energy & Sustainability. *Impact Evaluation of the California Comprehensive Residential Retrofit Programs*. (June 2014). CEE-400-2014-014. Access date: 05/09/2016

<http://www.energy.ca.gov/2014publications/CEC-400-2014-014/CEC-400-2014-014.pdf> Energy saving per retrofit was calculated based on total number of upgrades and program total annual adjusted energy saving for single-family and multi-family units separately. The electricity saving range from 600-1,500 kWh/year and the natural gas saving range from 40-60 therm/year.

³¹ City planning and building department provided to EPIC the number of new home constructed in the City from 2012-2015. The annual average is 110 new units, higher than the estimates from SANDAG growth forecast. The conservative numbers from SANDAG were used to be consistent with energy use projection and VMT projection, which used the same growth forecast as a main input source.

replacing a natural gas water heater with a SHW is 109 therm.³² EPIC used the average energy saving in the San Diego region as proxy for estimating the energy saving from BE-2 in the City.

Assuming 60% of existing water heaters are natural gas water heater and 40% are electric, emissions reduction from annual electricity savings was calculated by multiplying the number electric water heaters replaced with SHWs, electricity saving and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction from energy retrofits decreases accordingly. Similarly, emissions reduction from annual natural gas savings was calculated by multiplying the number of natural gas water heaters replaced with SHWs, natural gas saving, and natural gas emission factor.

Similar to BE-1, emissions reduction from electricity and natural gas saving were summed to determine total emissions reduction. Table 16 summarizes the key assumptions and results. In Table 16, energy savings and GHG emissions reduction are the results in year 2020 and 2030 only.

Table 16 Key Assumptions and Results for BE-2: Require New Single-Family Homes to Install Solar Water Heaters

Year	Number of new homes after 2012 with SHW	Energy Saving		GHG Emissions Reduction		
		Electricity Saving (kWh)	Natural gas saving (therm)	Reduction from electricity saving (MT CO ₂ e)	Reduction from natural gas saving (MT CO ₂ e)	Total Reduction (MT CO ₂ e)
2020	130	147,940	17,040	38	93	130
2030	413	468,861	225,081	16	1,225	1,241

6.1.3 BE-3: Adopt Higher Energy Efficiency Standards for Commercial Buildings

Starting in 2018, BE-3 would require 1) all new commercial buildings, including commercial portion of mixed-use projects, and 2) commercial building modifications, alterations, and additions that require building permits with an area larger than 10,000 square feet, to meet the 2016 California Green Building Standards Code (2016 CalGreen) Nonresidential Tier 1 Voluntary Measures.³³

Not all commercial energy use is covered by Title 24 energy standards. For electricity end use, heating, water heating, cooling, ventilation, exterior lighting and 50% of interior lighting are regulated by energy standards. For natural gas end use, heating, water heating and cooling are regulated by energy standards.³⁴ For an average commercial building in the SDG&E service area, 51% of end use electricity use and 68% of end use natural gas use are covered by energy standards, therefore, would be covered by BE-3.³⁵ EPIC used the average energy use covered by energy standards in the SDG&E service area as proxy for estimating the energy saving from BE-3 in the City.

³² California Distributed Generation Statistics. CSI Thermal Program Data. 2010-2015 Rebates in San Diego region. Downloaded date: 04/11/2017 <http://www.californiadgstats.ca.gov/downloads/>

³³ CalGreen Nonresidential Tier 1 requires less than or equal to 90% of title 24 part 5 energy budget for new construction and additions with both indoor lighting and mechanical systems. <https://www.documents.dgs.ca.gov/bsc/CALGreen/CALGreen-Guide-2016-FINAL.pdf> EPIC assumes the energy reduction from BE-3 will be 10%.

³⁴ California Emissions Estimator Model (CALEEMOD). Appendix E Technical Source Documentation. (September 2016). <http://www.caleemod.com/>

³⁵ Itron. *California Commercial End-Use Survey*. (March 2006). CEC-400-2006-005. SDG&E results by segment. Figure 11-3 and Figure 11-4. <http://www.energy.ca.gov/ceus/>

Emissions reduction from annual electricity saving was calculated by multiplying square footage of new retail and office spaces, electricity reduction per square footage, and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction from electricity saving decreases accordingly. Similarly, emissions reduction from annual natural gas savings was calculated by multiplying square footage of new retail and office spaces, natural gas saving per square footage, and natural gas emission factor.

Similar to BE-1 and BE-2, emissions reductions from electricity and natural gas saving were summed to determine total emissions reduction. Table 17 summarizes the key assumptions and results. In Table 17, energy savings and GHG emissions reduction are the results in year 2020 and 2030 only.

Table 17 Key Assumptions and Results for BE-3: Adopt Higher Energy Efficiency Standards for Commercial Buildings

Year	New retail & office space adopts higher energy standard after 2012 (sq ft)	Energy Saving		GHG Emissions Reduction		
		Electricity Reduction (kWh)	Natural Gas Reduction (therm)	from Electricity Reduction (MT CO ₂ e)	from Natural Gas Reduction (MT CO ₂ e)	Total GHG Reduction (MT CO ₂ e)
2020	92,241	231,313	7,204	59	39	98
2030	437,047	1,078,640	33,592	37	183	220

6.1.4 BE-4: Require Commercial Buildings to Install Solar Water Heaters

BE-4 also would start in 2018 and require the installation of solar water heaters (SWHs) or other efficiency technology on 1) all new commercial buildings, including commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with an area larger than 10,000 sq. ft., unless the installation is impracticable due to poor solar resources. Other efficiency technology would include installation of a renewable energy technology system that uses renewable energy as the primary energy source for water heating.

The estimated new commercial space square footage is the same used in BE-3. In the SDG&E service area, the average electricity energy intensity for water heating is estimated to be 0.16 kWh/sq. ft., and the average natural gas energy intensity for water heating is estimated to be 8.6 kbtu/sq. ft., across all commercial building types.³⁶ These average energy intensities in the SDG&E service area are used as a proxy for estimating the energy saving from BE-4 in the City of Encinitas. EPIC assumed the solar fraction of the water heater is 80%, therefore, replacing either electric or natural gas water heaters with SHWs will saving 80% of the water heating energy use.³⁷

Emissions reduction from annual electricity saving was calculated by multiplying the square footage of new retail and office spaces with electric water heater, electricity saving per square footage by replacing electric water heater with SHW, and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction from installing SHW decreases accordingly. Similarly, emissions reduction from annual natural gas savings was calculated by multiplying the square footage of

³⁶ Itron. *California Commercial End-Use Survey*. (March 2006). CEC-400-2006-005. SDG&E results by segment. Table 11.3 and Table 11.5. <http://www.energy.ca.gov/ceus/>

³⁷ Solar fraction is the ratio of total solar energy delivered to tank to total energy delivered to tank. <https://sam.nrel.gov/content/solar-fraction-water-heating-model>

new retail and office spaces with natural gas water heater, natural gas saving per square footage by replacing natural gas water heater with SHW, and natural gas emission factor.

Similar to the building energy actions above, emissions reduction from electricity and natural gas saving were summed to determine total emissions reduction. Table 18 summarizes the key assumptions and results. In Table 18, energy savings and GHG emissions reduction are the results in year 2020 and 2030 only. In San Diego region, on average 1 square foot of SHW produces about 59 kWh or 2.8 therms of energy for water heating.³⁸ Table 18 also shows the total square footage of SHW as a result of BE-4.

Table 18 Key Assumptions and Results for BE-4: Require Commercial Buildings to Install Solar Water Heaters

Year	Square footage of commercial SHW after 2012	Energy Saving		GHG Emissions Reduction		
		Electricity Reduction (kWh)	Natural Gas Reduction (therm)	from Electricity Reduction (MT CO ₂ e)	from Natural Gas Reduction (MT CO ₂ e)	Total GHG Reduction (MT CO ₂ e)
2020	40,148	11,930	111,848	3	609	612
2030	179,764	53,419	500,804	2	2,726	2,728

6.1.5 MBE-1: Implement Energy Efficient Projects in Municipal Facilities

MBE-1 aims to implement energy efficient projects in municipal facilities to reduce municipal energy use (electricity and natural gas) by 7.5% below 2012 baseline energy use by 2020 and 15% by 2030. The 2012 baseline electricity use was 1.9 million kWh and 41,570 therms across all municipal facilities, including the Civic Center, libraries, Community Center, fire stations, and parking lots.³⁹ As for now, no municipal facility expansion is planned, for the CAP horizon; therefore, EPIC assumed the energy use would be the same as baseline year energy use over the CAP horizon.

Emissions associated with annual electricity reductions were calculated by multiplying the target reduction percentage, baseline electricity use, and the weighted average emission factor. As the renewable content in electricity increases, the emissions reduction implementing energy efficiency projects decreases accordingly. Similarly, emissions reduction from annual natural gas savings was calculated by multiplying the target reduction percentage, baseline natural gas use, and natural gas emission factor.

Similar to the building energy actions above, emissions reduction from electricity and natural gas saving were summed to determine total emissions reduction. Table 19 summarizes the key assumptions and results. In Table 19, energy savings and GHG emissions reduction are results in year 2020 and 2030 only.

Table 19 Key Assumptions and Results for MBE-1: Implement Energy Efficient Projects in Municipal Facilities

³⁸ California Distributed Generation Statistics. CSI Thermal Program Data. 2010-2015 Rebates in San Diego region. Downloaded date: 04/11/2017 <http://www.californiadgstats.ca.gov/downloads/>

³⁹ FY 2005-2017 municipal facilities energy uses were provided by City public works department to EPIC in March 2017. Fiscal year 2011-2012 energy consumption was used as proxy for baseline energy use.

Year	Target Energy Reduction	Energy Reduction		GHG Emissions Reduction		
		Electricity Reduction (kWh)	Natural gas Reduction (therm)	from Electricity Reduction (MT CO ₂ e)	from Natural Gas Reduction (MT CO ₂ e)	Total GHG Reduction (MT CO ₂ e)
2020	8%	144,841	3,118	37	17	54
2030	15%	289,682	6,236	10	34	44

6.2 Renewable Energy (RE)

The goal of the Renewable Energy Strategy is to increase renewable electricity supply in homes, business, and municipal operations through the following city actions.

6.2.1 RE-1: Establish a Community Choice Energy Program or Similar Program

Through RE-1, City staff would present to City Council for consideration a Community Choice Energy Program (CCE) or similar program that increases the renewable electricity supply. To estimate the associated emissions impacts, EPIC assumed that the City would launch a CCE or similar program with RPS-compliant 33% renewable electricity supply by 2020 and 100% renewable electricity supply by 2030. EPIC assumed the customer participation rate would be 80%; therefore, 80% of the electricity load (not including distributed solar PV generation) would be supplied by the CCE or similar program starting in 2020.⁴⁰

As described in Section 4.2.1, renewable electricity in the City is supplied by several sources, including the renewable electricity supply by the utility (SDG&E), the CCE or similar program, and distributed solar PV systems. Given the assumptions included in the CAP for those categories, 39% of Citywide electricity would be supplied by renewables by 2020 and 92% by 2030.

Because the CCE or similar program is required to comply with the statewide RPS requirement, a portion of the total emissions reduction is attributed to RPS compliance (Section 5.1), while the remaining emissions impact (above RPS compliance) is allocated to RE-1. The emissions reduction from RE-1 in 2020 and 2030 is given in the last column of Table 20. The GHG emissions reduction is the results in year 2020 and 2030 only.

Table 20 Key Assumptions and Results for RE-1: Establish a Community Choice Energy Program or a Similar Program

⁴⁰ 80% customer participation rate is a conservative assumption. Customer participation rates of current Community Choice Aggregation (CCA) programs ranges from 80% (earlier CCAs such as Marin Clean Energy and Sonoma Clean Power) to 99% (recent launched CleanPowerSF). % customer participation rate may not equal to % load supply. For example, some big commercial customers may cover a majority of commercial customer class electricity load. For the calculation purpose, we assumed % customer participation rate is the same as % electricity load. <http://www.renewableenergyworld.com/articles/2016/05/san-francisco-s-community-choice-aggregation-program-for-clean-energy-goes-online.html>

Year	% of gross generation supplied by CCE or a similar program	% Renewable in CCE or a similar program	% Renewable needed for RPS Compliance	Emissions reduction from CCE or a similar program (MT CO ₂ e)	Emissions reduction from CCE or a similar program comply with RPS (MT CO ₂ e)	Emissions reduction from RE-1 (MT CO ₂ e)
2020	73%	33%	33%	18,103	18,103	-
2030	66%	100%	50%	87,288	43,644	43,644

6.2.2 RE-2: Require New Homes to install Solar Photovoltaic (PV) Systems

RE-2 would require all new single-family and multi-family homes starting in 2018 to install solar photovoltaic (PV) systems, unless the installation is impracticable due to poor solar resources.

The solar PV system size requirement for new single-family homes is to install at least 1.5 W solar PV per sq. ft. or a minimum of 2 kW per home. For example, for a new single-family home with 2,000 sq. ft., the PV system size required is at least 3 kW. The solar PV system size requirement for new multi-family homes is to install at least 1 W solar PV per sq. ft. or minimum of 1 kW per unit.⁴¹

The method to estimate the number of new single-family constructed every year is described in Section 0. EPIC used the similar method to estimate the number multi-family homes constructed every year using SANDAG Series 13 Regional Growth Forecast. With limited data available on the square footage of new homes in the City, EPIC used the minimum system requirements to estimate the PV capacity as a result of RE-2.

Assuming 20% of the new homes are not subject to RE-2 due to poor solar resources, the PV capacity was estimated by multiply the number of new homes with solar PV systems and minimum system requirement. The capacity is converted to estimated electricity generation using a capacity factor of 20%.⁴² The emissions reduction allocated to RE-2 is described in Section 5.2: SRE-1 California Solar Program. Table 21 summarizes the key assumptions and results. In Table 21, the GHG emissions reduction is the result in year 2020 and 2030 only.

Table 21 Key Assumptions and Results for RE-2: Require New Homes to install Solar PV Systems

Year	Single-family Homes		Multi-family Homes		All Homes	
	Number of new homes with solar PV systems after 2012	PV System Capacity (kW)	Number of new homes with solar PV systems after 2012	PV System Capacity (kW)	PV System Capacity (kW)	GHG Emissions Reduction (MT CO ₂ e)

⁴¹ The solar capacity per square footage requirement is similar to the City of Santa Monica's adopted solar ordinance, the local amendments to California Energy Code.

https://www.smgov.net/Departments/OSE/Categories/Green_Building/Solar_Ordinance.aspx The minimum solar system size alternative is similar to the City of Lancaster's mandatory solar requirement for new homes.

<http://programs.dsireusa.org/system/program/detail/5624> From 2009 to current, the median solar PV system size at new homes (single-family and multi-family) in the City is 5.1 kW. Based on New Solar Homes Partnership database. <https://www.newsolarhomes.org/WebPages/Public/Reports.aspx>

⁴² The net capacity factor is the ratio of actual output over a period of time to its potential to full installed (i.e. nameplate) capacity continuously over the same period of time.

2020	185	370	25	25	395	141
2030	359	718	351	351	1,069	614

6.2.3 RE-3: Require Commercial Buildings to install Solar Photovoltaic (PV) Systems

RE-3 would start in 2018 and require the installation of at least 2 watts (W) solar PV per sq. ft. of building area on 1) all new commercial buildings, including commercial portion of mixed-use projects, 2) commercial building modifications, alterations, and additions that require building permits with square footage larger than 10,000 sq. ft., unless the installation is impracticable due to poor solar resources. For example, if the commercial space is 2,000 sq. ft., the PV system size required is at least 4 kW.⁴³

The method to estimate the square footage of new commercial spaces every year is described in Section 6.1.3. Assuming 10% of the new commercial spaces are not subject to RE-3 due to poor solar resources, the PV capacity was estimated by multiply the square footage of new commercial spaces with solar PV system and minimum system requirement. The capacity is converted to estimated electricity generation using a capacity factor of 20%.⁴⁴ The emissions reduction allocated to RE-3 is described in Section 5.2: SRE-1 California Solar Program. Table 22 summarizes the key assumptions and results. In Table 22, the GHG emissions reduction is the result in year 2020 and 2030 only.

Table 22 Key Assumptions and Results for RE-3: Require Commercial Buildings to install Solar PV Systems

Year	PV system capacity for new commercial spaces after 2012 (kW)	GHG Emissions Reduction (MT CO ₂ e)
2020	166	59
2030	787	452

6.2.4 MRE-1: Supply Municipal Facilities with Onsite Renewable Energy

MRE-1 aims to supply municipal facilities with onsite renewable energy to achieve “Net Zero Electricity” municipal operations. Based on the City’s solar assessment report, to offset 100% of the city operations’ annual electricity consumption, 1.3 MW of solar PV capacity would be needed. Currently, the City has solar PV systems at two facilities, the Civic Center and Olivenhain sewer pump station, that total 95 kW of capacity.⁴⁵ Combined with MBE-1 (implement energy efficiency projects at city facilities), any excess electricity could be sold back to grid or used to offset other energy use at city facilities, such as natural gas use for heating and cooling.

The target is to supply 50% of city facilities electricity use by onsite renewable (0.65 MW PV system) by 2020 and supply all city facilities electricity use by onsite renewable (1.3 MW PV system) by 2030.

⁴³ The solar capacity per square footage requirement is similar to the City of Santa Monica’s adopted solar ordinance, the local amendments to California Energy Code.

https://www.smgov.net/Departments/OSE/Categories/Green_Building/Solar_Ordinance.aspx

⁴⁴ The net capacity factor is the ratio of actual output over a period of time to its potential to full installed (i.e. nameplate) capacity continuously over the same period of time.

⁴⁵ City of Encinitas Solar Assessment Report (Updated April 2016). September 28, 2016 City Council Meeting Item 10E. http://encinitas.granicus.com/MetaViewer.php?view_id=7&clip_id=1384&meta_id=65847

The capacity is converted to estimated electricity generation using a capacity factor of 20%.⁴⁶ The emissions reduction allocated to MRE-1 is described in Section 5.2: SRE-1 California Solar Program. Table 23 summarizes the key assumptions and results. In Table 23, the GHG emissions reduction is the result in year 2020 and 2030 only.

Table 23 Key Assumptions and Results for MRE-1: Supply Municipal Facilities with Onsite Renewable Energy

Year	Additional PV system capacity at municipal facilities after 2012 (MW)	GHG Emissions Reduction (MT CO ₂ e)
2020	0.65	233
2030	1.3	746

6.3 Clean and Efficient Transportation (CET)

The goal of the Clean and Efficient Transportation strategy is to reduce vehicle miles traveled (VMT), reduction on-road fuel use, and increase the use of alternative fuels through the following city actions.

6.3.1 CET-1: Complete and Implement the Citywide Active Transportation Plan

The Citywide Active Transportation Plan is under development, therefore, the emissions reduction is currently not quantifiable. The Active Transportation Plan will integrate the existing transportation and mobility plans including Bike Master Plan and Pedestrian Master Plan.⁴⁷ The impact of the Active Transportation Plan on reducing VMT and increasing mass transit, bike and walk mode share will be assessed once the plan is completed.

Since the adoption of 2005 Bicycle Master Plan, the City has added 28.5 miles of new Class II bike facilities, including 16.7 miles in baseline year 2012 and 1.8 miles after 2012; and 11.8 miles of new Class III bike facilities, including 0.5 miles after 2012.⁴⁸ The City has also improved existing bike facilities including adding bike land buffers and green paints.

6.3.2 CET-2: Implement a Local Shuttle Program

CET-2 would implement the service routes recommended in the Encinitas Transit Feasibility Study, including two express services to Mira Costa College (MCC) and La Costa Canyon High School (LCC HS) by 2020, one Encinitas Circulator and one with COASTER connection by 2025.⁴⁹ Compressed natural gas (CNG) busses would be used for these routes.⁵⁰

⁴⁶ The net capacity factor is the ratio of actual output over a period of time to its potential to full installed (i.e. nameplate) capacity continuously over the same period of time.

⁴⁷ Encinitas. Transportation & Mobility. <http://ci.encinitas.ca.us/Resident/Encinitas-Environment/Transportation-Mobility>

⁴⁸ A GIS layer with existing bike facilities by class with mileage and installation date was provided by the City to EPIC in April 2017.

⁴⁹ The Transit Feasibility Study (June 2014) was provided by the City planning and building department to EPIC in March 2017.

⁵⁰ CNG buses are recommended in the Transit Feasibility Study based on North County Transit District (NCTD)'s current fleet makeup, but other alternative fueled buses could be considered.

6.3.2.1 Local Shuttle Program Routes

Mira Costa College (MCC) Express

The proposed MCC Express will provide local buses and COASTER Encinitas station connections for the students attending both MCC campuses, with two morning trips and two afternoon trips on weekdays. EPIC estimated the annual miles avoided using the estimated passenger ridership of the MCC Express (9,000 passengers a year) and the average round trip distance per passenger if they were to drive between campuses (30 miles/round trip). The Transit Feasibility Study recommends a mid-size CNG bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 6,264 miles per year.

La Costa Canyon High School (LCC HS) Express

The proposed LCC HS Express will connect Carlsbad and coastal Encinitas residents attending LCC HS and connects COASTER Encinitas station, with one morning trip and one afternoon trip on school days. EPIC estimated the annual miles avoided using the estimated passenger ridership of the LCSS Express (6,300 passengers a year) and the average round trip distance per passenger if they or their parents were to drive from Carlsbad or coastal Encinitas to campus (15 miles/round trip). The Transit Feasibility Study recommends a full-size CNG bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 3,024 miles per year.

Encinitas Circulator

The proposed Encinitas Circulator will serve general destinations in the City, including Encinitas Library, apartments, shopping centers, and office complexes, with 12 loop trips during the day. EPIC estimated the annual miles avoided using the estimated passenger ridership of the Encinitas Circulator (27,630 passengers a year) and the average round trip distance per passenger if they were to drive to the destinations (4 miles/round trip). The Transit Feasibility Study recommends a small CNG bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 31,682 miles per year.

COASTER Connection

The proposed COASTER Connection will provide transit commuters traveling to and back from San Diego via southbound COASTER service, with three morning trips and three afternoon trips on weekdays. EPIC estimated the annual miles avoided using the estimated passenger ridership of the COASTER Connection (9,292 passengers a year) and the average round trip distance per passenger if they were to drive to their jobs in San Diego or Sorrento Valley (40 miles/round trip). The Transit Feasibility Study recommends a small CNG bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 12,240 miles per year.

6.3.2.2 Emissions Avoided and Added due to the Local Shuttle Program

EPIC converted the avoided VMT, from reduced commuter miles and/or reduced City internal trips, to GHG emissions reduction using the average vehicle emission factor (Section 4.3.1). Running four CNG buses also adds GHG emissions to the City. EPIC estimated the emissions from CNG combustion by multiplying annual miles drive by the buses, cubic foot of CNG needed per mile, and GHG emissions per cubic foot of CNG.⁵¹

⁵¹ GHG emissions rate for CNG is approximately 54 gram CO₂e per standard cubic foot (54 g CO₂e/scf), based on ARB California's GHG Inventory. https://www.arb.ca.gov/cc/inventory/doc/doc_index.php Cubic foot of CNG

Table 24 summarizes the key assumptions and results. In Table 24, the VMT reduction and net GHG emissions reduction are the results in year 2020 and 2030 only.

Table 24 Key Assumptions and Results for CET-2: S Implement a Local Shuttle Program

Year	VMT Reduction (miles/year)	GHG Emissions Reduction due to miles avoided (MT CO ₂ e)	GHG Emissions added due to new local shuttles (MT CO ₂ e)	Net GHG Emissions Reduction (MT CO ₂ e)
2020	364,500	145	15	130
2030	874,989	260	88	172

6.3.3 CET-3: Update the City's Circulation Element to Improve Traffic Flow

CET-3 would improve the traffic flow in the City by retiming traffic signals and install roundabouts at intersections in the City.

6.3.3.1 Retime Traffic Signals

The City would retime uncoordinated signals in a centralized manner to improve traffic flow and reduce traffic delays and congestion, which results in on-road fuel reduction. The City already has retimed 60 traffic signals to improve efficiency and coordination.⁵² The effect of retiming traffic signals on fuel reduction at the intersection was estimated based on SANDAG's studies on traffic signal optimization.⁵³

6.3.3.2 Roundabouts

Similar to retiming traffic signals, installing roundabouts at intersections can improve traffic flow, which can reduce on-road fuel use. The City has already identified potential sites for roundabouts, including three roundabouts completed by 2020 and four completed by 2030.⁵⁴ The effect of roundabouts installation on fuel reduction at the intersection was estimated based on technical studies and La Jolla Bird Rock roundabouts case studies.⁵⁵

6.3.3.3 Emissions Reduction from CET-3

EPIC estimated the emissions reduction based on number of traffic signals retimed and roundabouts installed, San Diego region fleet average miles per gallons and the average vehicle emission factor. Table

needed per miles (0.03 miles/scf) is calculated based on CNG Diesel Gallon Equivalent (0.729 DGE/therm), fuel economy of CNG bus (4.5 miles/DGE), and heat content of CNG (0.01 therm/scf). CNG DGE is based on California Energy Commission Transportation Energy Data, Facts and Statistics.
http://www.energy.ca.gov/almanac/transportation_data/gge.html Fuel economy of CNG bus is based on National Renewable Energy Lab Technical Report *Foothill Transit Battery Electric Bus Demonstration Results*. (Jan 2016).
<http://www.nrel.gov/docs/fy16osti/65274.pdf>

⁵² Number and timeline of traffic signal retiming were provided by City traffic engineer to EPIC in March 2017.

⁵³ Silva-Send, N., et al., *Cost effectiveness comparison of certain transportation measures to mitigate greenhouse gas emissions in San Diego County, California*. Energy Policy (2013). SANDAG Traffic Signal Optimization Program. Fuel savings per intersection in future years are modified based on improved fuel economy.

⁵⁴ Potential sites were provided by the City based on its approved budget as of summer 2017. . Sites to be completed by 2020 include intersections in Leucadia Coast Highway 101 Streetscape project, Birmingham Ave and Newcastle intersection and the Birmingham Ave and Interstate 5 intersection,.

⁵⁵ Silva-Send, N., et al., *Cost effectiveness comparison of certain transportation measures to mitigate greenhouse gas emissions in San Diego County, California*. Energy Policy (2013). Fuel savings per intersection in future years are modified based on improved fuel economy.

25 summarizes the key assumptions and results. In Table 25, the GHG emissions reduction and equivalent fuel saving per intersection are the results in year 2020 and 2030 only.

Table 25 Key Assumptions and Results for CET-3: Update the City's Circulation Element to Improve Traffic Flow

Year	Roundabouts Installation			Traffic Signal Retiming			Total
	Additional Roundabouts after 2012	Equivalent Gallons Fuel Savings per Intersection	GHG Emissions Reduction (MT CO ₂ e)	Number of Traffic Signals Retimed after 2012	Equivalent Gallons Fuel Saving per Intersection	GHG Emissions Reduction (MT CO ₂ e)	Total GHG Emissions Reduction (MT CO ₂ e)
2020	3	16,480	416	60	6,456	3,256	3,671
2030	4	12,280	413	60	4,811	2,426	2,839

6.3.4 CET-4: Require Residential Electric Vehicle Charging Stations

Starting in 2018, CET-4 would require new residential units to install electric vehicle charging station (EVCS). Specifically, new single-family homes would be required to install complete 40-amp electrical circuit (EV Ready)⁵⁶ and new multi-family homes, to install EVCS equipment at 5% of the total number of parking spaces.⁵⁷

EPIC estimated number of EV-ready parking spaces at single-family homes and number of EVCS for multi-family home based on the City's parking spaces requirement and number of new homes. Based on the Encinitas Municipal Code off-street parking spaces requirement, each new single-family home will have on average at least two parking spaces and each new multi-family home will have on average at least 2.25 parking spaces.⁵⁸ The methods to estimate number of new single-family and multi-family homes constructed every year are described in Section 0 and Section 6.2.2.

For the EV-ready single-family homes, EPIC assumed the residents would be twice as likely to drive EVs and install EVCSs as average person in the San Diego region. For example, in 2020, 3% of light-duty vehicle VMT will be driven by EVs, therefore, 6% of the EV ready spaces would have EVCS installed and EVs parked, under the assumptions used here.⁵⁹ For multi-family homes, EPIC assumed all the parking spaces with EVCS would only be used for EV parking.

⁵⁶ This is the same requirement as the electric vehicle charging for new construction requirement for new single-family (A4.106.8.1) in 2016 CalGreen Residential Voluntary Measures. https://www.ladbs.org/docs/default-source/publications/code-amendments/2016-calgreen_complete.pdf?sfvrsn=6

⁵⁷ The number of parking spaces with EVCS should be at least one. This is one step further than the requirements of EVCS for new multi-family construction (A4.106.8.2) in 2016 CalGreen Residential Voluntary Measures, which only requires EV spaces capable of supporting future installation.

⁵⁸ Parking requirements for multi-family homes depend number of bedrooms of the units, the average 2 spaces per unit and 0.25 spaces per unit for guest parking are used. Encinitas Municipal Code. 30.54.030 Schedule of Required Off-street Parking. <http://www.qcode.us/codes/encinitas/>

⁵⁹ EPIC estimated the ratio of EV VMT to light-duty vehicle VMT from 2018-2030 using EMFAC2014 output for the San Diego region. Light-duty vehicle include all passenger cars and light-duty trucks under EMFAC vehicle classification.

To avoid double counting, EPIC allocated the emissions reduction from California ZEV program to CET-4, using the ratio of new EVs as a result of CET-4 to new EVs as a result of ZEV program, as described in Section 4.3.2. Table 26 summarizes the key assumptions and results. In Table 26, the GHG emissions reduction is the result in year 2020 and 2030 only.

Table 26 Key Assumptions and Results for CET-4: Require Residential Electric Vehicle Charging Stations

Year	Single-Family		Multi-Family		All Homes	
	EV-ready Parking Space after 2012	Additional EVCS after 2012	% of Parking Space with EVCS	Additional EVCS after 2012	EVCS at New Homes after 2012	GHG Emissions Reduction from CET-4 (MT CO ₂ e)
2020	986	58	5%	8	65	185
2030	1,334	329	5%	44	374	1,357

6.3.5 CET-5: Require Commercial Electric Vehicle Charging Stations

CET-5 would require commercial electric vehicle charging station (EVCS) installation at 8% of the total number of parking spaces starting 2018.⁶⁰ The requirement would apply to 1) all new commercial buildings, including commercial portion of mixed-use projects, 2) commercial buildings modifications, alterations, and additions that require building permits with square footage larger than 10,000 sq. ft.

EPIC estimated the number of EVCS at commercial parking spaces based on the City's parking spaces requirement and square footage of new and retrofitted commercial spaces. Based on the Encinitas Municipal Code off-street parking spaces requirement, on average at least one parking space is need for 200 sq. ft. commercial spaces.⁶¹ The method to estimate the square footage of new commercial spaces every year is described in Section 6.1.3. In the past few years, on average the City issued permits for 4 major commercial retrofit projects that meets the CET-5 criteria. The sq. ft. for the projects are not available, therefore, EPIC assumed conservatively 50,000 sq. ft. commercial space retrofits would be affected by CET-5.

Similar to CET-4, EPIC assumed all the parking spaces with EVCS would only be used for EV parking and emissions reduction from ZEV program were allocated to CET-5 using the method described in Section 4.3.2. Table 27 summarizes the key assumptions and results. In Table 27, the GHG emissions reduction are the results in year 2020 and 2030 only.

Table 27 Key Assumptions and Results for CET-5: Require Commercial Electric Vehicle Charging Stations

Year	New Commercial Space	Retrofitted Commercial Space	Total
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⁶⁰ The number of parking spaces with EVCS should be at least one. This is one step further than the requirements of EV charging in 2016 CalGreen Nonresidential Voluntary Measures (A5.106.5.3.1), which only requires EV spaces capable of supporting future installation <https://www.documents.dgs.ca.gov/bsc/CALGreen/CALGreen-Guide-2016-FINAL.pdf>

⁶¹ Parking requirements for commercial spaces range from 1 space per 100 sq. ft. to 500 sq. ft. gross floor area, the average is used. Encinitas Municipal Code. 30.54.030 Schedule of Required Off-street Parking. <http://www.qcode.us/codes/encinitas/>

	% of Parking Space with EVCS	Additional EVCS after 2012	% of Parking Space with EVCS	Additional EVCS after 2012	EVCS at Commercial Space after 2012	GHG Emissions Reduction from CET-5 (MT CO ₂ e)
2020	8%	94	8%	60	154	440
2030	8%	232	8%	260	492	1,789

6.3.6 MCET-1: Transition to Efficient Municipal Fleet

The City maintains a vehicle fleet for municipal operations use. MCET-1 would include a municipal fleet replacement plan to 1) convert gasoline-fueled cars and light-duty trucks to alternative fuel vehicles, including EVs, and/or downsize to smaller and more fuel-efficient vehicles 2) incorporate renewable diesel for diesel-fueled heavy-duty trucks. Through the municipal fleet replacement plan, goal is to reduce city fleet fossil fuel use (gasoline and diesel) 10% by 2020 and 30% by 2030.

The current fleet fuel consumption is approximately 35,000 gallons of gasoline and 26,000 gallons of diesel in baseline year 2012.⁶² EPIC assumed the fuel needs for municipal operations will remain the same during the CAP time horizon. The GHG emissions reduction is based on fuel saving and the emission factor of each fuel type.⁶³ Table 28 summarizes the key assumptions and results. In Table 28, fuel reductions and the GHG emissions reduction are the results in year 2020 and 2030 only.

Table 28 Key Assumptions and Results for MCET-1: Transition to Efficiency City Municipal Fleet

Year	Fossil Fuel Use (gasoline & diesel) Reduction	Gasoline Reduction (gallons)	Diesel Reduction (gallons)	GHG Emissions Reduction (MT CO ₂ e)
2020	10%	3,566	2,607	55
2030	30%	10,699	7,820	166

6.4 Water Efficiency (WE)

The goal of Water Efficiency strategy is to reduce Citywide potable water use through the following city action.

6.4.1 WE-1: Complete Water Rate Study and Implement New Water Rates

WE-1 evaluates the impact of the new water rates after baseline year 2012 approved by two water districts that provide water to the City, San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD).

For OMWD, the most recent 6.5% water rate increase was approved in March 2017 for 2017-2018. For 2012 to 2016, the cumulative water rate increase is approximately 25%.⁶⁴ For SDWD, the most recent

⁶² Fiscal year 2012, 2015 and 2016 estimated fleet fuel consumption were provided by City public works department to EPIC in March 2017. FY2015 and FY2016 total fuel consumption for both gasoline and diesel are approximately 57,000 gallons.

⁶³ Emission factors are approximately 19 lbs CO₂e/gallon gasoline and 22 CO₂e/gallon diesel. U.S Energy Information Administration. <https://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11>

⁶⁴ OMWD's water rate increase information. <https://www.olivenhain.com/wp-content/uploads/2017/01/0217WW-Final.pdf>

annual water rate increase was 6.5% in 2016 and 2017 and similar rate increases were approved for the years before.⁶⁵ Based on the approved water rate increase in OMWD and SDWD, EPIC assumed the Citywide annual average water rate increase was 6% from 2012-2017. Based on studies, the price elasticity of water is set at -0.2, as an increase in the water rate will reduce water consumption.⁶⁶

Reduction in water use will reduce the energy associated with upstream water supply, water treatment, and distribution. EPIC assumed water sources provided by both water districts would not change over the CAP horizon, with the same mix of local surface water and imported water from the San Diego County Water Authority. The emissions reduction is the difference between emissions from the water category in the emissions projection and emissions from the water category after the rate increase. Table 29 summarizes the key assumptions and results. In Table 29, water reduction and the GHG emissions reduction are the results in year 2020 and 2030 only.

Table 29 Key Assumptions and Results for WE-1: Complete Water Rate Study and Implement New Water Rates

Year	Cumulative Water Rate Increase after 2012	Reduction in Water Use (gallon per person per day)	Reduction in Water Use (million gallons)	GHG Emissions Reduction (MT CO ₂ e)
2020	34%	5	258	712
2030	34%	5	266	735

6.5 Zero Waste (ZW)

The goal of the Zero Waste Strategy is to divert solid waste from landfills through the following city action.

6.5.1 ZW-1: Implement a Zero Waste Program

Through ZW-1, the City would implement a Zero Waste program to reduce waste disposal from residents and businesses in the City, to achieve 65% waste diversion rate or 5.3 pounds per person per day (PPD) waste disposal by 2020, and 80% waste diversion rate or 3 PPD waste disposal by 2030.

The City had a 5.6 pounds per person per day (PPD) waste disposal in baseline year 2012, which is equivalent to an approximately 62% diversion rate. From 2012 to 2015, the diversion rates fluctuated between 59% and 62%.⁶⁷ The City has not completed a waste characteristics study recently, therefore, EPIC assumed the waste composition for the CAP time horizon would be the same as the statewide average. The emissions reduction from increasing diversion rate is the difference between the emissions

⁶⁵ Information on water rate increases provided by SDWD. SDWD will be doing a new 2-year water rate study in summer 2017 that would determine the water rate in 2018-2019. For WE-1, only the impact of the approved water rate from 2012-2017 was evaluated.

⁶⁶ Dale et al. (2009) *Price Impact of the Demand for Water and Energy in California Residences*.

<http://www.energy.ca.gov/2009publications/CEC-500-2009-032/CEC-500-2009-032-F.PDF>

⁶⁷ Method to convert PPD to estimated diversion rate is based on Calrecycle.

<http://www.calrecycle.ca.gov/LGCentral/Basics/PerCapitaDsp.htm#UsingPerCapita> Jurisdiction PPD from 2012-2015 were downloaded from CalRecycle Jurisdiction Diversion Summary.

<http://www.calrecycle.ca.gov/LGCentral/reports/diversionprogram/JurisdictionDiversionPost2006.aspx>

from the waste category in the emissions projection and the emissions from solid waste category using the target diversion rates and PPD. Table 30 summarizes the key assumptions and results. In Table 30, equivalent waste disposal and the GHG emissions reduction are the results in year 2020 and 2030 only.

Table 30 Key Assumptions and Results for ZE-1: Implement a Zero Waste Program

Year	Target Diversion Rate	Per Capita Waste Disposal Equivalent to Target Diversion Rate (pounds/person/day)	Citywide Waste Disposal Equivalent to Target Diversion Rate (metric tons/year)	GHG Emissions Reduction (MT CO ₂ e)
2020	65%	5.3	54,679	2,830
2030	80%	3.0	32,254	11,921

6.6 Reduce Off-Road Equipment (OR)

The goal of Reduce Off-Road Equipment strategy is to reduce off-road fuel use through the following city action.

6.6.1 OR-1: Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers

OR-1 would prohibit all 2-stroke leaf blowers by 2020 and implement the phase-out of leaf blower emissions in the Environmental Commission work plan item.⁶⁸

Limited data are available on the fuel use of specific lawn and garden equipment. Based on the OFFROAD2007 model lawn and garden equipment category, 2-stroke leaf blowers are the fourth most used type of equipment in the category.⁶⁹ EPIC estimated that 20% of the emissions from the lawn and garden equipment would be attributed to 2-stroke leaf blowers. Assuming the gasoline equipment will be replaced by electric equipment, indirect GHG emission from electricity use will be added, the estimated emissions reduction from the equipment switch in the SDG&E service area is 40%.⁷⁰ Table 31 summarizes the key assumptions and results. In Table 31, the GHG emissions reduction is the result in year 2020 and 2030 only.

Table 31 Key Assumptions and Results for OR-1: Adopt a Leaf Blower Ordinance to limit use of 2-stroke Leaf Blowers

Year	% 2-stroke leaf blowers prohibited	GHG Emissions Reduction (MT CO ₂ e)
2020	100%	128
2030	100%	142

⁶⁸ Encinitas Environmental Commission. December 11, 2014. Action Item 7A.

http://encinitas.granicus.com/MetaViewer.php?view_id=7&clip_id=1088&meta_id=44216

⁶⁹ ARB Off-road emissions inventory program. <https://www.arb.ca.gov/msei/offroad.htm>

⁷⁰ California Air Pollution Control Officers Association (CAPCOA). Quantifying Greenhouse Gas Mitigation Measures. (August 2010) Area Landscaping A-1 Landscaping Equipment. Assuming the equipment horsepower is less than 25. <http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf>

6.7 Carbon Sequestration (CS)

The goal of Carbon Sequestration strategy (CS) is to increase urban tree cover through the following city action.

6.7.1 CS-1: Develop and implement an Urban Tree Planting Program

The most recent urban tree canopy assessment in San Diego region, based on high-resolution Light Detection and Ranging (LiDAR), shows the City has approximately 22% existing urban tree canopy.⁷¹ CS-1 would develop and implement starting in 2018 an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs. The goal is to plant 50 net new trees every year.

The GHG sequestration potential from the net new trees is based on the total number of new trees planted and the CO₂ absorption rate per tree.⁷² Table 32 summarizes the key assumptions and results. In Table 32, the GHG emissions reduction is the results in year 2020 and 2030 only.

Table 32 Key Assumptions and Results for Urban Tree Planting Program

Year	Number of Net New Trees Planted annually	Additional Trees Planted after 2012	GHG Emissions Reduction (MT CO ₂ e)
2020	50	150	5
2030	50	650	23

⁷¹ The assessment was done in 2014 for all urban areas in the San Diego County using method developed by University of Vermont and USDA Forest Service.

https://www.sandiego.gov/sites/default/files/san_diego_tree_canopy_assessment_05oct2016.pdf

⁷² On average the CO₂ sequestration rate is 0.035 metric ton CO₂ per tree per year. The carbon sequestration rate depends on the tree species, climate zone, planting location and tree ages. EPIC used the average here, the actual carbon sequestration rate will be evaluated once the parameters are decided in implementation the Urban Tree Planting Program. California Emissions Estimator Model (CALEEMOD). Appendix E Technical Source Documentation. (September 2016). <http://www.caleemod.com/>

Appendix C

Comparison of 2011 and 2017 CAPs

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Appendix C: Comparison of City of Encinitas 2011 CAP and 2017 CAPs

2017 CAP	2011 CAP
Strategy 1: Building Efficiency	Residential Building Strategy Non-Residential Building Strategy Municipal Strategy
Goal 1.1: Reduce Residential Building Consumption	Objective: Increase Energy Efficiency of Residential Buildings Objective: Promote Renewable Energy Installations on Residential Buildings Objective: Increase Energy Efficiency of Non-Residential Buildings Objective: Promote the Construction of Green Buildings
City Actions	Measures
BE-1 Require Energy Audits of Existing Residential Units	R-1 Point-of-sale energy efficiency audits for existing residential buildings.
BE-2 Require New Single-Family Homes to Install Solar Water Heaters	R-3 Solar PV and solar water heating on all new single-family residential building construction.
BE-3 Adopt Higher Energy Efficiency Standards for Commercial Buildings	NR-3 New non-residential buildings to exceed Title 24 by 15 percent.
BE-4 Require Commercial Buildings to Install Solar Water Heaters	N/A
Supporting Measure (Goal 1.1): Facilitate homeowner and business owner financing of energy efficiency measures by expanding PACE financing options. Supporting Measure (Goal 1.1): Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region	R -1 New Residential Buildings to Perform 15 Percent Above Title 24 Code.
Supporting Measure (Goal 1.1): Expand and implement a Green Building Incentive Program to promote energy retrofits at homes and businesses.	R-6 City of Encinitas' Green Building Incentive Program NR -1 City of Encinitas' Green Building Incentive Program. NR-2 Mandatory green building program for new non-residential buildings over 5,000 SF by 2020.
Goal 1.2: Reduce Municipal Operation Energy Consumption	Objective: Institutionalize Green Building Practices
City Actions	Measures
MBE-1 Continue Implementation of Energy Efficient Projects in Municipal Facilities	M-7 All new municipal buildings over 5,000 SF to achieve LEED silver. M-8 Existing municipal buildings over 5,000 SF to achieve LEED silver. M-9 Retrofit projects on existing municipal buildings less than 5,000 SF.
Strategy 2: Renewable Energy	Municipal Strategy
Goal 2.1: Increase Renewable Electricity Supply in Homes and Businesses	Objective: Promote Renewable Energy Installations on Residential Buildings Objective: Promote the Construction of Green Buildings Objective: Promote Renewable Energy Installations on Non-Residential Buildings
City Actions	Measures

2017 CAP	2011 CAP
RE-1 Establish a Community Choice Energy or Similar Program	N/A
RE-2 Require New Homes to install Solar Photovoltaic Systems	R-3 Solar PV and solar water heating on all new single-family residential building construction.
RE-3 Require Commercial Buildings to install Solar Photovoltaic Systems	NR-5 Solar PV on existing non-residential roof area.
Supporting Measure (Goal 2.1): Expand and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating at homes and businesses. Supporting Measure (Goal 2.1): Facilitate homeowner and business owner financing of renewable energy systems by expanding PACE financing options. Supporting Measure (Goal 2.1): Educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.	R-4 Solar Water Heating on Existing Single-Family Residential Buildings R-5 Solar PV on Existing Single-Family Residential Buildings R-6 City of Encinitas' Green Building Incentive Program NR-4 Solar PV on New Non-Residential Buildings NR-5 Solar PV on Existing Non-Residential Roof Area
Goal 2.2: Increase Renewable Electricity Supply in Municipal Operations	Objective: Install Renewable Energy Systems
City Actions	Measures
MRE-1 Supply Municipal Facilities with Onsite Renewable Energy	M-10 On-site renewable energy on new municipal buildings M-11 On-site renewable energy on existing municipal buildings
Strategy 3: Water Efficiency	Water Strategy Municipal Strategy
Goal 3.1: Reduce City-wide Potable Water Consumption	Objective: Conserve Water Resources Objective: Increase Water Efficiency and Reuse
City Actions	Measures
WE-1 Complete Water Rate Study and Implement New Water Rates	N/A
Supporting Measure (Goal 3.1): Facilitate homeowner and business owner financing of water efficiency measures by expanding PACE financing options. Supporting Measure (Goal 3.1): Educate homeowners and businesses about water efficiency rebate and incentive programs. Supporting Measure (Goal 3.1): Conduct audits and retrofit all municipal facilities with water-efficient features to reduce potable water use at municipal facilities.	W-1 Installation of water efficient appliances in existing and new buildings
Supporting Measure (Goal 3.1): Offer incentive programs for reduced indoor and outdoor water consumption. Supporting Measure (Goal 3.1): Increase outdoor landscape reclaimed water use at city parks, open space, and other municipal facilities. Supporting Measure (Goal 3.1): Evaluate lowering the landscape area thresholds for projects to meet the Encinitas Water-Efficient Landscape Regulations.	W-2 Reduced water consumption and recycled water use in landscaping
Supporting Measure (Goal 3.1): Increase outdoor landscape reclaimed water use at city parks, open space, and other municipal facilities.	M-5 Increase reclaimed water use to all parks and open space.

2017 CAP	2011 CAP
Supporting Measure (Goal 3.1): Conduct audits and retrofit all municipal facilities with water-efficient features to reduce potable water use at municipal facilities.	M-6 Increase water efficiency in all city facilities
Strategy 4: Clean and Efficient Transportation	Transportation Strategy Municipal Strategy
Goal 4.1: Reduce Vehicle Miles Traveled	Objective: Reduce Employee Transportation Impacts Objective: Revise Parking Standards Objective: Promote Bicycle Use for Commuting and Recreation Objective: Encourage Alternative Commute Modes
City Actions	Measures
CET-1 Complete and Implement the Citywide Active Transportation Plan	N/A
CET-2 Implement a Local Shuttle System	N/A
Supporting Measure (Goal 4.3): Expand and implement a Green Building Incentive Program to increase electric vehicle charging at home and businesses. Supporting Measure (Goal 4.3): Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community. Supporting Measure (Goal 4.3): Develop and implement EV charging plan for municipal facilities. Supporting Measure (Goal 4.3): Pursue partnerships with school districts to explore the use of electric busing for schools. Supporting Measure (Goal 4.3): Implement educational activities to raise awareness about EVs among residents and businesses. Supporting Measure (Goal 4.3): Install EV charging stations at municipal buildings.	M 1 Alternative and More Fuel Efficient Vehicles
Supporting Measure (Goal 4.1): Develop and implement a complete streets policy. Supporting Measure (Goal 4.1): Develop program to support car sharing and bike sharing for the community.	M 2 Car sharing and bicycle sharing programs
Supporting Measure (Goal 4.1): Support SANDAG iCommute Program for guaranteed ride home for the community.	M 3 Guaranteed Ride Home for City Employees
N/A	M 4 Telework of Alternative Work Schedule Programs T-6 Telework or alternative work schedule programs.
N/A	T 1 Parking Maximums for New Commercial and Industrial Development
N/A	T 2 Parking Requirement Reduction for New Developments Close to Transit
Supporting Measure (Goal 4.1): Coordinate with regional transit authorities and local school districts to improve public transit options. Supporting Measure (Goal 4.1): Develop and implement a City Bike Rack Program.	T 3 Traffic Study to Identify and Implement Infrastructure Improvements

2017 CAP	2011 CAP
Supporting Measure (Goal 4.2): Identify rebate and incentive programs and financing opportunities for installing roundabouts.	
Supporting Measure (Goal 4.3): Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community. •	
Supporting Measure (Goal 4.1): Develop and implement a complete streets policy.	
Supporting Measure (Goal 4.1): Develop program to support car sharing and bike sharing for the community.	
Supporting Measure (Goal 4.1): Develop and implement a City Bike Rack Program.	T-4 Bikeway Master Plan Implementation and Action Item
Supporting Measure (Goal 4.3): Implement a wayfinding program with signage and information systems to facilitate walking, biking, and efficient driving and parking.	
Supporting Measure (Goal 4.1): Develop program to support car sharing and bike sharing for the community.	
Supporting Measure (Goal 4.1): Develop and implement a City Bike Rack Program.	T-5 Bicycle Lockers, Showers, and Bike Racks On-Site
Supporting Measure (Goal 4.1): Coordinate with regional transit authorities and local school districts to improve public transit options.	
Supporting Measure (Goal 4.3): Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community.	T-7 Capital project prioritization funding and agency coordination to encourage alternative transportation.
Supporting Measure (Goal 4.1): Develop and implement a complete streets policy.	
Supporting Measure (Goal 4.1): Complete Safe Routes to Schools projects to decrease need to drive students to school.	
Supporting Measure (Goal 4.1): Coordinate with regional transit authorities and local school districts to improve public transit options.	T-8 Complete neighborhood program.
Supporting Measure (Goal 4.3): Implement a wayfinding program with signage and information systems to facilitate walking, biking, and efficient driving and parking.	
Supporting Measure (Goal 4.1): Support SANDAG iCommute Program for guaranteed ride home for the community.	T-9 Guaranteed ride home program for the community.
Goal 4.2: Reduce On-road Fuel Use	Objective: Revise Parking Standards and Policies
City Actions	Measures
CET-3 Update the City's Circulation Element to Improve Traffic Flow	T-3 Traffic study to identify and implement infrastructure improvements.
Goal 4.3: Increase Use of Alternative Fuels	Objective: Reduce Employee Transportation Impacts
City Actions	Measures
CET-4 Require Residential Electric Vehicle Charging Stations	N/A
CET-5 Require Commercial Electric Vehicle Charging Stations	N/A
MCET-1 Transition to Efficient Municipal Fleet	M-1 Alternative and more fuel-efficient vehicles

2017 CAP	2011 CAP
Strategy 5: Reduce Off-Road Equipment	N/A
Goal 5.1: Reduce Off-Road Fuel Use	N/A
City Actions	N/A
OR-1 Adopt a Leaf Blower Ordinance to Limit Use of 2-stroke Leaf Blowers	N/A
Strategy 6: Zero Waste	Solid Waste Strategy
Goal 6.1: Divert Solid Waste	Objective: Reduce Waste from City, Citizen, and Business Operations
City Actions	Measures
ZW-1 Implement a Zero Waste Program	SW-1 Zero-Waste Community
Strategy 7: Carbon Sequestration	N/A
Goal 7.1: Increase Urban Tree Cover	N/A
City Actions	N/A
CS-1 Develop and Implement an Urban Tree Planting Program	N/A
Notes: CSE = Center for Sustainable Energy; EV = electric vehicle; PV = photovoltaic; SANDAG = San Diego Association of Governments; SDG&E = San Diego Gas & Electric Source: CTG 2011, EPIC 2017, and Ascent Environmental 2017.	

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Appendix D

Public Outreach and Engagement Plan

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Public Outreach and Engagement Plan **for the Climate Action Plan Update** **City of Encinitas**

PREPARED FOR

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Table 1

Climate Action Plan and CEQA Tentative Project Schedule

Figure 1

Climate Action Planning Process

1 INTRODUCTION

This Public Outreach and Engagement Plan (Plan) summarizes the strategies to engage the public and other interested parties in the preparation of a successful Climate Action Plan (CAP) update, along with the associated California Environmental Quality Act (CEQA) document. This Plan is intended to guide the efforts of the City of Encinitas (City) and the consultants, Ascent Environmental, Inc. (Ascent) and the Energy Policy Initiatives Center (EPIC). Goals and guiding principles for public engagement and outreach are described below, followed by a summary of specific outreach methods to be used during the climate action planning process. The major phases and outreach opportunities are illustrated in the CAP Tentative Project Schedule shown in Figure 1. The outreach and engagement program may evolve and change from that published in the Final Plan at the City's discretion to meet the CAP program needs and accommodate varying circumstances.

1.1 PURPOSE

The purpose of the outreach strategies and activities presented in this Plan are to provide local residents, stakeholders, interested parties, and other affected agencies and/or individuals with opportunities to become actively involved in development of the City's CAP update and the evaluation of associated environmental issues. The outreach program in this Plan will assist the City in both providing timely information to, and receiving input from interested parties during the development of the CAP update and CEQA document.

1.2 GOALS AND PRINCIPLES

The goals of outreach and engagement are to: (1) raise awareness of the CAP update; (2) educate the public and other organizations about the CAP update; (3) provide opportunities for input at the various steps of CAP development as discussed in Section 1.3.1.; (4) provide opportunities to influence decision-making on the CAP update; and (5) provide a public process that meets the CEQA Guidelines' requirements for a Plan for the reduction of greenhouse gas (GHG) emissions. The rationale for each of these goals includes the following principles:

- ▲ *Awareness* – Stakeholders must be aware of the planning process before they can participate.
- ▲ *Education* – Stakeholders must be educated and knowledgeable about the CAP update and planning process before they can participate effectively.
- ▲ *Input* – Stakeholders' knowledge and perspectives help the planning team¹ verify or expand on available information.
- ▲ *Decision-making* – Stakeholders are encouraged to engage in the decision-making process.
- ▲ *Open and public process* – As stated in CEQA Guidelines Section 15183.5 (b)(1)(F), a "qualified" GHG reduction plan must be adopted in a public process. Once adopted, the updated CAP would represent a qualified plan for reduction of GHG emissions, consistent with the requirement set forth in the CEQA Guidelines section cited above, and would support tiering of future development projects for purposes of CEQA review of GHG impacts. Having a clear process by which the public can be involved, review, and comment on the draft CAP will result in a better document that can be used later to streamline CEQA analysis and compliance for many types of projects in the city.

¹ The planning team consists of key City staff, representatives of SANDAG, and the CAP consultants, Ascent and EPIC.

1.3 CLIMATE ACTION PLAN AND CEQA PROCESS

The tentative project schedule in Table 1 shows a brief overview of the CAP and CEQA processes and how they connect to the outreach activities that are addressed in more detail in Section 3.

Table 1: Climate Action Plan and CEQA Tentative Project Schedule									
	2016		2017						
	November	December	January	February	March	April	May	June	July and beyond
GHG Emission Forecast	▲ Review existing GHG inventory	▲ Calculate updated baseline emissions; update ClearPath	▲ Calculate updated baseline emissions; update ClearPath	▲ Calculate updated baseline emissions; update ClearPath					
GHG Reduction Measure Analysis		▲ Research new GHG reduction measures	▲ Establish recommended GHG reduction targets and measures	▲ Calculate GHG reduction measures	▲ Technical report and updates to ClearPath				
CAP Update	▲ Review previous CAP update work	▲ CEQA consultation meeting	▲ Evaluate potential new measures with City staff	▲ Evaluate potential new measures with staff, Environmental Commission and public ▲ Begin development of draft updated CAP	▲ Continue to develop draft updated CAP using new forecast, measures and public input	▲ Finalize draft updated CAP using new forecast, measures and public input	▲ City staff, Environmental Commission and public reviews Draft CAP; incorporate comments	▲ Draft CAP complete	▲ Public review of CAP ends ▲ Final CAP presented to Environmental Commission
Public Engagement		▲ Develop community outreach plan ▲ Compile draft notification list	▲ Update at Environmental Commission meeting ▲ CAP Workgroup meetings ▲ Website updated and available for CAP information ▲ City Council Update	▲ Environmental Commission meeting ▲ Public Workshop # 1 ▲ CAP Workgroup meetings	▲ Environmental Commission meeting/workshop ▲ Public Workshop # 2 ▲ City Council Update ▲ CAP Workgroup meetings	▲ Update at Environmental Commission meeting ▲ Synthesize public input ▲ CAP Workgroup meetings	▲ Update at Environmental Commission meeting ▲ CAP Workgroup meetings	▲ Presentation of Draft Cap to Environmental Commission and City Council	▲ Public hearings on CAP Update and Final CEQA document ▲
Environmental Review							▲ Retain CEQA consultant		▲ Conduct Environmental Initial Study ▲ Develop Draft CEQA document ▲ Publish Draft CEQA document for public review ▲ Notice of Availability ▲ Notice of Completion ▲ Incorporate comments and create Final CEQA document ▲ Adopt/Certify Final CEQA document ▲ Public hearings on CAP Update and Final CEQA document ▲ Notice of Determination

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1.3.1 Climate Action Planning

The City will use a five-step process for climate action planning that was modeled after guidance from the International Council for Local Environmental Initiatives (ICLEI). ICLEI's Cities for Climate Protection™ Campaign assists local jurisdictions to adopt policies and implement quantifiable measures to reduce local GHG emissions, improve air quality, and enhance livability, sustainability, and resiliency. ICLEI's recommended five step process for climate action planning is summarized as follows:

▲ Step 1. Conduct a baseline emissions inventory and develop forecasts for future emissions

The City will calculate GHG emissions for a 2013 base year and for forecast years aligned with California's milestone years for GHG reduction (i.e., 2020, 2030, 2035, and 2050) based on local consumption and growth data for various sectors. The inventory and forecasts provide a benchmark against which the City can measure progress.

▲ Step 2. Establish an emissions reduction target for the forecast years

The City will establish emission reduction targets for community-wide GHG emissions and for municipal operations. These two targets will foster political will and create a framework to guide the planning and implementation of measures.



Figure 1: Climate Action Planning Process

▲ Step 3. Develop and adopt a Climate Action Plan

Through a multi-stakeholder process, the City will update the existing CAP with descriptions of the policies and measures that the local government may take to reduce GHG emissions and achieve its emissions reduction targets. The updated CAP will include a timeline, a description of possible financing mechanisms, and an assignment of responsibility to departments and staff. In addition to direct GHG reduction measures, the updated CAP will also incorporate public awareness and education efforts. Adoption of the updated CAP will require City Council approval.

▲ **Step 4. Implement policies and measures**

The City will implement the policies and measures contained in the CAP after the CAP has been adopted by the City Council. Policies and measures implemented by the City will encompass a variety of emissions sectors such as transportation, energy use, water consumption, waste generation, and other sectors that are part of the community-wide and municipal emissions inventory.

▲ **Step 5. Monitor and verify progress**

Monitoring and verifying progress on the implementation of measures to reduce or avoid GHG emissions is an ongoing process. Monitoring begins once measures are implemented and continues for the life of the measures, providing important feedback that can be used to improve the measures over time.

The five steps provide a flexible framework that can accommodate varying levels of analysis, effort, and availability of data. Climate action planning is an iterative process and needs to be revisited at regular intervals to ensure successful outcomes. This outreach and engagement program addresses how the City will engage with its citizens and stakeholders for the current iteration which will result in a qualified CAP as described in Section 1.4.1.

1.3.2 Environmental Review

The City will be preparing a CEQA document that will assess environmental effects of the updated CAP. The CEQA document will be developed subsequent to the CAP update and will be prepared and released for public review after the draft CAP update has undergone public review. The process for creating a CEQA document can be summarized as follows:

- ▲ **Environmental Initial Study** – At this stage, the lead agency (City of Encinitas) will determine whether the project may have a significant effect on the environment. (i.e. whether an EIR or negative declaration should be prepared.)
- ▲ **Draft CEQA Document** – Using the draft CAP update, the City will analyze the potential impacts of future development, disclose those impacts, and identify any necessary mitigation measures to avoid or reduce significant impacts.
- ▲ **Public Review of Draft CEQA Document** – The City will release the draft CEQA Document for public review and request agencies and the public to review and provide written feedback to the City on its analysis, disclosure of the environmental issues, and any necessary feasible mitigation measures of the proposed project (i.e., the CAP).
- ▲ **Response to Comments** – The City will provide written responses to comments received on the draft CEQA document.
- ▲ **Adoption or Certification of Final CEQA Document** – The City will develop a Final CEQA document and the City Council will consider whether to adopt/certify the Final CEQA document which includes the draft CEQA document, Responses to Comments, and changes to the draft CEQA document that may have been necessary to respond to comments.

1.4 PUBLIC INVOLVEMENT

1.4.1 Climate Action Plans

In 2010, additional guidance was added to the CEQA Guidelines which states that a qualified plan for the reduction of GHG emissions must “be adopted in a public process following environmental review” (CEQA Guidelines 15183.5 (b)(1)(F)). The City intends to develop an updated CAP to be consistent with the components of a qualified CAP per the Guidelines and provide a thorough outreach and engagement program as discussed in Section 3.

1.4.2 CEQA Process

When developing a CEQA document, a lead agency is required to notify the public at distinct stages of the process. CEQA also requires the lead agency to provide opportunities for public comment. The goal of these requirements is to fully inform the public, affected government agencies, and other interested parties of the environmental effects of the project and to provide opportunities to the public to comment on the impact conclusions and any mitigation measures. Public involvement in the CEQA process aims to ensure that the public has a voice in the decision-making process; specifically, that public concerns about environmental issues and the potential effects of the project on the physical environment are addressed prior to project approval. The legal public notification and commenting requirements associated with the CEQA process are outlined in Section 3 of this Plan.

2 GENERAL OUTREACH INFORMATION

To ensure broad and comprehensive outreach to the public and other interested parties, this plan includes several components and efforts that will support the overall process, including the designated Outreach/Engagement Coordinator, a summary of the media strategies and the appropriate contact, and how this process will be integrated with the CAP update and other planning processes. Each component or effort is briefly described below.

2.1 OUTREACH/ENGAGEMENT COORDINATOR

The role of the Outreach/Engagement Coordinator will be to serve as a central contact for the public and stakeholders for the CAP and CEQA document. For this project, the Outreach/Engagement Coordinator is also the CAP Program Administrator and will participate in, and help coordinate all facets of the implementation of the Outreach and Engagement Plan for the CAP.

Anyone seeking information on the CAP should contact:

Crystal Najera
Climate Action Program Administrator
City of Encinitas
505 S Vulcan Ave, Encinitas CA 92024
Phone: 760.943.2285
Email: cnajera@encinitasca.gov

Anyone seeking information on the CEQA document should contact:

Scott Vurbegg
Environmental Project Manager

Planning & Building Department
City of Encinitas
505 S Vulcan Ave, Encinitas CA 92024
Phone: 760.633.2692
Email: svurbEFF@encinitasca.gov

2.2 MEDIA STRATEGIES

The City will actively engage and alert appropriate media outlets with project updates at applicable milestones throughout the CAP update and CEQA process. Press releases will be circulated to announce public workshops and hearings, and the City will work with local media outlets and encourage them to follow the planning process and include features in local publications. Media strategies will be led by the CAP Program Administrator and supported by the planning team.

Media inquiries should be addressed to:

Mark Delin
Assistant City Manager
City of Encinitas
505 S Vulcan Ave, Encinitas CA 92024
Phone: 760.633.2612
Email: mdelin@encinitasca.gov

2.3 SYNCHRONIZATION OF OUTREACH WITH PLANNING MILESTONES

The City is committed to listening and demonstrating responsiveness to the community's input at each step in the planning process. As technical information and draft recommendations are available, they will be discussed with the public and other interested parties and presented on the website at the City's discretion. Key information will also be discussed at public workshops prior to the release of the draft updated CAP to allow participants to provide input and feedback. This input and feedback will be synthesized and used to guide the final recommendations in the CAP update. Through the CEQA process, the public will be given the opportunity to review and comment on environmental analysis of the proposed CAP update.

Outreach for the CAP update and CEQA document will be conducted consistent with the overall goals of the City (via the Strategic Plan). The Strategic Plan includes eight elements that represent the vital areas of focus for the City. Together, these elements and their associated goals are intended to ensure that the City's five unique communities can collectively thrive. Implementation of the CAP is one of three key goals of the "Environment" focus area of the Strategic Plan.

3 PUBLIC OUTREACH AND ENGAGEMENT PROGRAM

This section includes a brief description of each tool that the City plans to use as part of the outreach and engagement program along with a short explanation of the tool, including the following milestone indicator:

- **Project Milestone:** Indicates the target date(s) or project milestone(s) of the CAP/CEQA process in which the tool will be used.

3.1 NOTIFICATION LIST

An initial potential list of interested parties has been compiled from existing resources. The list will be used to notify interested parties of upcoming events and of postings of new materials on the project website. Persons will be added to the mailing list throughout the CAP and CEQA process and may sign up by sending a request to the CAP Program Administrator at cnajera@encinitasca.gov.

- **Project Milestone:** Ongoing.

3.2 CEQA NOTICES

The City will prepare all California environmental process notices to alert the public and stakeholders at critical points in the environmental review. The notices shall comply with CEQA and will be filed with the State Clearinghouse, as appropriate. The State Clearinghouse sends notices to State agencies, departments, boards, and commissions for review and comment; however, the City may have specific agency contacts when agency representatives have been working more closely with the City. Where possible, the City will send the notices directly to these specific contacts. The CEQA notices may include the following: Notice of Completion (NOC), Notice of Availability (NOA), and Notice of Determination (NOD).

- **Project Milestone:** Targeted dates as follows.

NOC and NOA – Fall/Winter 2017, when the draft CEQA document is released for public review.

NOD – Early 2018, if the City Council adopts the CAP and the Final CEQA document, then the NOD will be filed with the County Clerk by the City Planning & Building Department.

3.3 MEETINGS AND PUBLIC HEARINGS

3.3.1 CAP Workgroup

City staff department representatives will meet collectively throughout the CAP update process. The group includes members from the major, relevant City departments: Public Works and Engineering, Planning and Building, Human Resources, Information Technology, Finance, San Dieguito Water District, City Manager, Parks and Recreation, and Fire and Marine Safety. The group is expected to:

- ▲ review, provide comments, and recommendations for key work products (GHG inventory, draft CAP update, etc.);
 - ▲ provide recommendations on the feasibility of proposed CAP measures; and
 - ▲ use local expertise to offer recommendations on new and revised CAP measures and goals.
- **Targeted Project Milestones:** Biweekly meetings, as needed.

3.3.2 Environmental Commission Meetings

The CAP Program Administrator will present at regular monthly meetings to brief Environmental Commission members on the progress of the CAP update at key times in the process. In addition, the Environmental Commission monthly meetings in March and April will include an expanded discussion of preliminary GHG inventory results, proposed reduction targets, and preliminary list of GHG reduction measures. City staff and

consultants will present this information in a user-friendly format. These meetings will be intended to engage the Environmental Commission and solicit their feedback on draft GHG reduction measures. At these meetings, the Environmental Commission will have an opportunity to discuss the latest progress on the CAP update and provide comments. The public will also have an opportunity to provide comments at the meetings. The Environmental Commission may also elect to reconvene the CAP Update Ad-Hoc Committee to further review and discuss the CAP update.

► **Targeted Project Milestones:**

Monthly updates on topics such as the draft outreach plan, GHG emissions inventory, GHG reduction targets, draft GHG reduction measures, draft updated CAP, and other interim steps.

Draft GHG inventory and projections, proposed reduction targets, and GHG reduction measures workshops in March and April.

3.3.3 Community Workshops

City staff will conduct at least two (2) public workshops at strategic times during the planning process where members of the public will be able to receive up-to-date information on the planning process and provide input. Public comments received at the workshop(s) will be reviewed and used to inform the planning document. The City will present poster boards summarizing the baseline GHG inventory and projections, proposed reduction targets, and a preliminary list of GHG reduction measures for the public's input. Members of the public will be asked to prioritize measures based on their preferences and provide additional feedback on other measures they may want to see included.

► **Targeted Project Milestones:**

February and March 2017 – two public workshops to discuss the updated GHG inventory, recommended reduction targets, and preliminary list of GHG reduction measures.

3.3.4 City Council Updates

City staff will update the City Council on the CAP process, including on the GHG emissions inventory, reduction targets, public input, and progress on schedule. This is expected to be an informational item at a regular City Council meeting midway between the kickoff of the planning effort and the release of the draft CAP.

► **Targeted Project Milestones:**

January 2017 – City staff will present the CAP update schedule and proposed milestones.

March 2017 – City staff will present the GHG emissions inventory, proposed reduction targets and some of the major possible revised measures.

June 2017 – City staff will present the draft updated CAP.

3.3.5 Fall/Winter 2017/Early 2018 – City staff will present the final updated CAP and CEQA document. Public Hearings

The Environmental Commission and City Council will hold public hearings on the final draft CAP. These hearings will proceed in accordance with the City's public hearing requirements and will be announced via the City's newspaper legal advertisement requirements, including advertising the public hearings on the project website and sending an email notification to the notification mailing list (see 3.1). The public will be invited to comment during the public hearings.

► **Targeted Project Milestones:**

June 2017 – Environmental Commission and City Council public hearings on the draft updated CAP.

Fall/Winter 2017 – An Environmental Commission public hearing on the final updated CAP.

Winter 2017/2018 – The City Council will consider the Environmental Commission's recommendations and will consider adoption of the final updated CAP and the CEQA document.

3.4 OTHER ENGAGEMENT TOOLS

3.4.1 Project Website

The City's planning team will maintain a page on the City's website dedicated to the CAP update and CEQA processes. Interested parties will be able to sign up for the email notification list, view project documents, and find contact information to send comments and suggestions. Some interactive activities may be developed to mirror activities provided at the public workshops to allow interested parties to provide meaningful input if they are unable to attend a meeting in-person. The website will continue to be maintained throughout CAP implementation and will include a dynamic dashboard that shows the City's progress with respect to CAP goals and targets. The website address is:

<http://www.encinitasca.gov/climate>

► **Targeted Project Milestones:**

Ongoing – The website will be available and updated throughout the CAP update process.

3.4.2 Electronic Mail Notifications

Using the notification list (see Section 3.1), City staff will send email updates at key milestones in the planning process.

- **Targeted Project Milestones:** At least a week prior (or as required by legal statutes), to meetings, the day a document is released for public review, prior to the close of comment periods, and other times, as needed.

3.4.3 Press Releases

Press releases will be circulated to announce public workshops and public hearings. The City will work with local media outlets and encourage them to follow the CAP update process and include features in local publications. Media strategies will be led by the Assistant City Manager and supported by the CAP Program Administrator and planning team.

- **Targeted Project Milestones:** Prior to, or after, major milestones in the planning process such as meetings, workshops, hearings, community events, document releases, public review periods, etc.

3.4.4 Other Tools

Other tools may be used as needed, fact sheets, handouts, sample policy language, presentation boards, infographics, and other items.

- **Targeted Project Milestones:** As needed.

Appendix E

Summary of Public Input on CAP Update

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Public Comments and Responses

Comment Number	Source	Comment	Response
1	Place Speak	Using appliances after Peak Hours have passed; planting xeriscaped landscaping front and back yard; scheduling travel for work on two or three work-days only; air-conditioning one-room-only during 90 degree-plus summer-days; more detailed separation of solid-waste from other disposable trash; water plants sparingly; keeping travel-routes clear and unimpeded to pursue lower green-house gases.	The current CAP framework includes actions and supporting measures to address many of the issues raised by the commenter.
2	Place Speak	The technical studies for both the San Diego city and Chula Vista CAPs identified the formation of a Community Choice Aggregation (Energy) not-for-profit electricity provider as the single most effective measure to reduce greenhouse gas emissions. But I can't do that alone! Right now, the city of Encinitas is working with Oceanside, Carlsbad, Solana Beach, and and Del Mar to study forming a CCA. Support them!	RE-1 would establish a Community Choice Aggregation Program
3	Place Speak	I walk or ride my bicycle wherever I go, no longer use single-use plastics (grocery bags, water bottles, etc.). My next car will be an electric vehicle and I plan to support all measures to increase public transportation.	CET-1 would complete and implement the City-wide Active Transportation Plan. CET-4 Require new single-family homes to meet the CALGreen single family Residential Voluntary Requirement for electric vehicle charging stations. Require new multi-family homes to install electric vehicle charging stations at 5% of total parking spaces. CET-5 Require new and altered commercial buildings to install electric vehicle charging stations at 8% of total parking spaces.
4	Place Speak	This Placespeak software sucks! The resources tab (with the images) crashed my Safari browser. The browser crash log is appended below. Why do I have to register to give my government feedback! That violates my free speech rights which this Canadian company doesn't understand. If you censor this comment then I'll sue the City of Encinitas for First Amendment violations. Why don't you just use the City's website along with SurveyMonkey? [crash log removed]	Comment noted.
5	Place Speak	Neighborhood Electric Vehicles which are Golf Cart like vehicles... highway capable electric vehicles are great but most are expensive and our Coastal community needs do not require transit over long distances. NEV's can replace much of the transportation needs when biking and walking cannot suffice. But Cities like Encinitas does not have much for safe passageway of these vehicles. Certainly Trenching and Covering our citizen owned railroad and putting a parkway for bikes, walkers and NEV's would be a great decision. But expand this beyond the Parkway that should be built over our railroad. We need a transit plan that encourages the use of NEV's. This solves many problems besides climate action.... also Parking!	The City's Coastal Mobility and Livability Workgroup is currently evaluating the cost and feasibility of lowering to railroad to provide increased pedestrian access. The Circulation Element update could consider improved access and options for Neighborhood Electric Vehicles.
6	Place Speak	Leaving aside the argument on whether and to what extent man is causing climate change, can any of you elected officials please explain how anything the city of Encinitas does will have any affect whatsoever on the world's climate?	Many communities throughout California and the United States are developing Climate Action Plans. Cumulative incremental reductions in emissions from multiple communities can add up to significant greenhouse gas reductions. Additionally, cities like Encinitas that lead by example show and encourage their constituents to also take actions that help reduce emissions.

7	Place Speak	The bus schedules are nearly impossible to figure out. The only times are for the main stations. I have no idea what time the bus passes cardiff, leucadia or any other coastal stop. Amazing with today's technology you can tell where every Uber or Lyft car is and how long it takes to get to you. But impossible to tell when a bus will come by. Want more people to bus? Make it easier.	CET-2 Implement a local shuttle system to connect with regional transit system and employee system.
8	Place Speak	I would encourage more people to use electric vehicles by changing the city policy of charging citizens for permits to put in residential charging stations for Electric Vehicles. Make it free. In fact, as long as a registered electrician does the work it should be just a matter of dropping off a document at the city office. I am in the market for a new car because my current car broke down. Decided against EV due to not wanting the costs and delays of the city permitting process for a charge station. regards Cliff Keller	Since 2012, the City has waived permit fees for home electric vehicle (EV) charging systems and most permits are approved over the counter when an application is filed. CET-4 would require new single-family homes to be "EVCS Ready" and require new multi-family homes to install EV charging stations. CET-5 would require new and altered commercial buildings to install EV charging stations. CET-4, CET-5, and the City's current Energy Efficiency Permit Fee Waiver and Reduction Program all aim to encourage increased use of EVs.
9	Place Speak	Electric cars Walk or bike for short excursions Encourage kids to walk or bike. Use public transport... Promote public transport. Encourage the city to move towards public transport.	CET-1 would complete and implement the City-wide Active Transportation Plan. CET-4 Require new single-family homes to meet the CALGreen single family Residential Voluntary Requirement for electric vehicle charging stations. Require new multi-family homes to install electric vehicle charging stations at 5% of total parking spaces. CET-5 would require new and altered commercial buildings to install electric vehicle charging stations at 8% of total parking spaces. CET-1 would complete and implement the City-wide Active Transportation Plan. CET-2 would implement a local shuttle system to connect with regional transit system and employee system.
10	Place Speak	Mind telling me how replacing my lawn has an impact on your stupid argument about our supposed harming of the environment. I mean seriously, even if your specious argument of "greenhouse gases" was true, my lawn would actually be helpful. Helpful in drought conditions? Maybe. But otherwise...come on.	Delivering water to homes for irrigating landscaped areas takes a significant amount of energy. Greenhouse gases are emitted when that energy is expended. Reducing outdoor irrigation would reduce emissions.

11	Place Speak	Low-water landscaping doesn't need weekly mowing plus saving water saves electricity. From EPA.gov: Energy is used in five stages in the water cycle: -Extracting and conveying water: Extracting water from rivers and streams or pumping it from aquifers, and then conveying it over hills and into storage facilities is a highly energy intensive process. In California, the State Water Project (SWP) pumps water almost 2000 ft over the Tehachapi Mountains! The SWP is the largest single user of energy in California. It consumes an average of 5 billion kWh/yr, accounting for about 2 to 3 percent of all electricity consumed in California. -Treating water: Water treatment facilities use energy to pump and process water. -Distributing water: Energy is needed to transport water. - Using water: End users consume energy to treat water with softeners or filters, to circulate and pressurize water with circulation pumps and irrigation systems, and to heat and cool water. -Collecting and treating wastewater: Energy is used to pump wastewater to the treatment plant, and to aerate and filter it at the plant. On average, wastewater treatment in California uses 500 to 1,500 kilowatt-hours per acre-foot.	<p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. City of Encinitas tracks the installation of these BMPs in GIS and could possible account for any benefits. Capture and reuse is required on most projects not (called Priority Projects in BMP Manual).</p> <p>Additionally, the Clean Water Program, as part of the implementation of the Carlsbad Watershed Water Quality Improvement Program, will implement a residential and property manager incentive program to encourage the voluntary use of Low Impact Design features in residential and commercial landscaping.</p>
12	Place Speak	This is much bigger than a city, county or state issue. It's a world issue if anything is going to be, or needs to be, done. The City of Encinitas is wasting time and resources spending time on it. Public transportation doesn't work in our city, nor does carpooling or trying to make the city more "walkable." Most residents (over 80%) need to drive to their places of employment outside of the city. People in Encinitas are making smart, cost saving decisions (electric cars, LED's, low-water landscaping, etc.) because it makes sense and saves money. NOT because of the "Climate Action Plan." Stop wasting our resources on it.	Comment Noted.
13	Email	The resumption of school busing could produce significant reductions in VMT and GRG emissions. This measure should be added in the CAP as an action to reduce emissions in the Transportation section	CET-2 would implement a local shuttle system to connect with regional transit system and employee system. CET includes supporting measure to explore partnerships with school districts to increase use of electric school busing
14	Email	Supports CCA and wants the city to move forward with conducting the Clean Energy feasibility study.	RE-1 would establish a Community Choice Aggregation Program
15	Env. Commission Meeting	Are there going to be more frequent checkpoints other than 2020, 2030, 2050?	The CAP would include a provision for monitiong and progress reporting on a regular basis.
16	Env. Commission Meeting	Consider textile recycling for emission reduction.	ZW-1 would implement a Zero Waste Program. A ZW supporting measure would develop education program for textile recycling.
17	Env. Commission Meeting	Urban Forestry Management Plan should be included as a measure in the updated CAP and Urban Forest Management should reduce number of palm trees that don't sequester as much carbon and increase planting in vacant tree sites.	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs
18	Env. Commission Meeting	(Item 7A) Asked for a breakdown of what the State and Federal Category includes.	A final breakdown will be included in the CAP.

19	Env. Commission Meeting	(Item 7A) Asked what the emission standards are for CO2 and CH4 (Methane Gas) for leakage and storage of natural gas. EPIC to provide methane leaks emissions for CAP update and coordinating with SDSU professor.	Methane leakage is typically not included in GHG inventories using the US Community Protocol. Chun-Ta Lai, a San Diego State University associate professor of biology has developed a map of methane leaks in the San Diego region. See http://yeyelobet.maps.arcgis.com/apps/webappviewer/index.html?id=452855a14ac64b7aa6d2119be7a5b81d
20	Env. Commission Meeting	(Item 7A) Ensure that energy efficiency goal includes appliances and LED lighting. Confirm energy efficiency goals are	The CAP will include a statewide measure to capture statewide energy efficiency policies and targets and the effects of appliance standards.
21	Env. Commission Meeting	(Item 7A) Include textile recycling as a measure in CAP	ZW-1 would implement a Zero Waste Program. A ZW supporting measure would develop education program for textile recycling.
22	Env. Commission Meeting	(Item 7A) Water category should specify that the water reduction is from potable water.	The goals in the water efficiency category specify potable water.
23	Env. Commission Meeting	(Item 7A) Requested future participation on CAP updates in the following months from the environmental commission and the public. *Staff later noted that we can offer an additional informational workshop once draft CAP is out.	City staff will offer an additional public workshop once the draft update CAP is available for public review.
24	Env. Commission Meeting	(Item 7A) Ensure there are more than enough actions and supporting measures included to achieve overall targets and goals. If one action or measure cannot be implemented, there should be backups.	The final list of actions will meet the CAP GHG reduction targets.
25	Env. Commission Meeting	(Item 7A) Included municipal goals and actions in CAP update.	Municipal actions will be specified in the CAP.
26	Env. Commission Meeting	(Item 7A) Ensure the CAP recommendations report is considered for incorporation into the goals, measures, actions, and supporting measures.	A review of Environmental Commission CAP Subcommittee CAP Update Recommendations Report was conducted. A cross-referencing table was developed to track how each recommendation is addressed in the updated CAP. This table will be included as an appendix to the updated CAP.
27	Env. Commission Meeting	(Item 7A) Asks for EDCO to do an education workshop on how containers should be cleaned when recycled. He also wants to know what the developed area for the planting of trees requires. He emphasizes the importance of making sure that trees aren't shading solar rooftops. He points out that there is no metric for 2020 on the 25% developed area.	The updated Urban Forestry action (CS-1) would be measured in number of trees rather than coverage of developed area. Comment about recycling education is noted.
28	Env. Commission Meeting	(Item 7A) Wants to see the feasibility study for CCA voted on and implemented.	RE-1 would establish a Community Choice Aggregation Program
29	Env. Commission Meeting	(Item 7A) Under the water section, she wants to advocate for additional measures looking at water efficiency and nexus of water and energy. Also supports future public workshops once draft is available.	GHG reduction estimates for all water reduction measures are done by estimating the embedded energy in water. City staff will offer an additional public workshop once the draft update CAP is available for public review.
30	Env. Commission Meeting	(Item 7A) offered to present carbon-reducing programs provided by SDG&E to the Commission.	The Building Efficiency strategy has a supporting measure to educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.

31	Env. Commission Meeting	(Item 7B) Since measure T did not pass, will the CAP be legally binding or not? *Staff to verify	The City is developing a CEQA qualified CAP that may be used as a programmatic document to assess emissions from new development project applications. The City is currently working on developing a revised Housing Element that can be supported by the community. If warranted, the City will consider using the updated Climate Action Plan as mitigation for environmental impacts potentially caused by the Housing Element update.
32	Env. Commission Meeting	(Item 7B) Provide cross-reference of CAP Subcommittee Recommendations report and noting which recommendations were or were not incorporated into the CAP update.	A separate review of Environmental Commission recommended elements and how they are addressed in the draft CAP matrix has been provided.
33	Env. Commission Meeting	(Item 7B) Education outreach should be included as a City action or measure.	Education and outreach is incorporated as a supporting measure in nearly all strategies.
34	Env. Commission Meeting	(Item 7B) Top three species in Encinitas are palm trees which have negative carbon sequestration because of pruning and equipment used. He wants the vacant sites to be appropriate canopy trees to sequester carbon. Clarify top-dressing of compost as a measure so that it is an effective measure.	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs. Also the supporting measure for this action would adopt practices for turf management which specify the top-dressing of compost to increase carbon sequestration at City parks.
35	Env. Commission Meeting	(Item 7B) Ask for the creation of a legally binding CAP and stated that there is public support to make CAP legally binding. Asked for additional informational workshops.	The City is developing a CEQA qualified CAP that may be used as a programmatic document to assess emissions from new development project applications. City staff will offer an additional public workshop once the draft update CAP is available for public review.
36	Env. Commission Meeting	(Item 7B) If we are going to be planting trees, what would be the water costs? How this is reflected in the water efficiency measures?	Consultants are currently assessing whether and how to account for the tradeoffs between planting trees and water use and costs and the results will be incorporated into the updated CAP.
37	Env. Commission Meeting	(Item 7B) Wants a measurable and enforceable climate action plan.	The City is developing a CEQA qualified CAP that will include a process for monitoring and reporting progress.
38	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Toyota, Honda and Ford are advancing hydrogen vehicles. What's missing is a hydrogen fuel infrastructure.	MCET-2 would transition the city fleet to a greater mix of alternative, electric, and fuel efficient vehicles. Hydrogen vehicles will be considered and included in this transition where feasible.
39	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Roads are too car centric. People will never leave cars unless other forms of transit are viable and perceived as safe. Current roads fail in that respect.	CET-1 would complete and implement the City-wide Active Transportation Plan. Related supporting measures, include developing and implement a Complete Neighborhood Program to reduce the need to drive to routine goods and services, developing a program to support car sharing and bike sharing for the community, completing Safe Routes to Schools projects to decrease need to drive students to school, coordinating with regional transit authorities and local school districts to improve public transit options, supporting SANDAG iCommute Program for guaranteed ride home for the community, and developing and implementing a City Bike Rack Program.
40	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Electric buses for local shuttle service.	CET-2 would implement a local shuttle system. Electric vehicles will be considered, if practical and feasible.

41	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Shade over bus stops.	Comment noted.
42	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	The plans are great but you must implement them. Are there definite plans for allocating funds for implementation?	After the CAP update is completed, the City plans to develop an Implementation Plan for the CAP which will which will address funding allocation.
43	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	I would like to see cities, buildings, businesses encouraged to put in solar chargers, but not mandated. Prefer incentives and practical common sense.	RE-2 would require new single-family and multi-family homes to install solar photovoltaic (PV) system. RE-3 would require new commercial buildings and modifications, alterations, and additions to install solar photovoltaic (PV) system. CET-4 would require new single-family homes to meet the CALGreen single family Residential Voluntary Requirement for electric vehicle charging stations. Require new multi-family homes to install electric vehicle charging stations at 5% of total parking spaces. CET-5 would require new and altered commercial buildings to install electric vehicle charging stations at 8% of total parking spaces.
44	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	No bike lanes on Circulation Element unless they can be additional lanes. No closing down of lanes on El Camino Real but fine with extra right of way.	CET-1 Complete and implement the City-wide Active Transportation Plan. CET-2 Implement a local shuttle system to connect with regional transit system and employee system. CET-3 Update the City's Circulation Element to improve traffic flow and promote active transportation and complete streets. Related supporting measures include developing and implementing a Complete Neighborhood Program to reduce the need to drive to routine goods and services
45	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Use an app to report pot holes and other transportation obstacles. Also use for continuous update of circulation. Votes: 1	The City currently has an app called SeeClickFix, that can be used to report potholes or any other issue identified throughout the City. The app can be found on the City's website. http://www.cityofencinitas.org/Resident/SeeClickFix
46	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Sorry to see that restoration of school busing had not made the list yet. Is that a lost cause? Votes: 2	CET-2 would implement a local shuttle system to connect with regional transit system and employee system. CET includes supporting measure to explore partnerships with school districts to increase use of electric school busing
47	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	See Laguna Beach and Dana Point's free local shuttle system. It's been a big hit. Votes: 1	CET-2 would implement a local shuttle system to connect with regional transit system and employee system.
48	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Mandate alternatives to one parent/one child/ one car to and from school.	CET-2 would implement a local shuttle system to connect with regional transit system and employee system. CET includes supporting measure to explore partnerships with school districts to increase use of electric school busing
49	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Many telephone poles are being removed as lines go underground. Why not put solar panels on them instead and hook them into our grid?	RE-2 Require new single-family and multi-family homes to install solar photovoltaic (PV) system. RE-3 Require new commercial buildings and modifications, alterations, and additions to install solar photovoltaic (PV) system.

50	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Provide support for the creation of community bicycle co-op. They help in recycling of bikes, and getting affordable transportation to more people, as well as teaching necessary skills for bicycle upkeep to keep those riding more.	Comment noted. CET-1 would complete and implement the City-wide Active Transportation Plan. Related supporting measures include developing program to support car sharing and bike sharing for the community and developing and implement a City Bike Rack Program.
51	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Follow examples of Styrofoam ban. City did an excellent job of educating restaurant owners and helping them transition. Do the same for leaf blowers, etc.	OR-1 would adopt a Leaf Blower Ordinance to limit use of 2-stroke leaf blowers. A related supporting measures would educate home and business owners about alternatives to gas-powered leaf-blowing technologies.
52	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Solar heating of water is a "hot topic" that should be promoted alongside PV.	BE-2 would require new single-family homes to install solar water heater or other efficient technology. BE-4 would require new commercial buildings and modifications, alterations, and additions to install solar water heating or other efficient technology.
53	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	How will the 2019 building standards update affect these measures?	The CAP estimates emissions reductions gained from state and federal laws and regulations and this is incorporated into the overall reduction calculation.
54	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	With a CCA in place, maximize rooftop solar to generate our own electricity and install developing storage capacity to deal with intermittent source.	RE-1 would establish a Community Choice Aggregation Program.
55	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Require/incentivize smaller homes on large development.	The City is currently looking at this as part of the Housing Element update. If any regulations or incentive programs are established that would reduce emissions, they will be incorporated into future CAP updates.
56	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	CCA will be biggest gain plus save money.	RE-1 would establish a Community Choice Aggregation Program.
57	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Develop programs that change signals to blinking yellow outside of rush hour, peak traffic times, or go to more roundabouts. Eliminate waiting of lights. Votes: 1	CET-3 would update the City's Circulation Element to improve traffic flow and promote active transportation and complete streets.
58	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Note that for Encinitas: Electricity is 24% GHG emissions; Natural Gas is 13% of GHG emissions. Therefore more effort should be made to get clean electricity than to reduce gas heating or transition heating to electric. CCA and electricity efficiency have more impact than building thermal efficiency.	RE-1 would establish a Community Choice Aggregation Program. RE-2 would require new single-family and multi-family homes to install solar photovoltaic (PV) system. RE-3 would require new commercial buildings and modifications, alterations, and additions to install solar photovoltaic (PV) system. Related to comment about efficiency, no specific efficiency technologies are identified in the CAP.
59	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	CCA. Yes.	RE-1 would establish a Community Choice Aggregation Program.
60	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Unless the electricity for electric car charging stations is produced from renewable sources, it may be questionable if there will be reductions of carbon emissions overall, though probably reduced air pollution from use of EVs.	Current electricity supply from SDG&E is 43% renewable. The statewide target is 50% renewable by 2030. Associated emissions from an average EV in San Diego is lower than those of the average gasoline-fueled vehicle. The draft CAP includes framework includes RE-1, which would establish a Community Choice Aggregation Program
61	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Incentives rather than mandates.	The current CAP framework includes a mix of requirements and incentives.

62	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Develop set of standards to evaluate an energy efficiency grade for commercial buildings to be part of any re transaction. All commercial buildings need to be graded on an energy efficiency standard.	State law (AB 1103) currently requires disclosure of commercial energy consumption and the California Energy Commisison is developing regulatory programs to implement this law.
63	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Have an electric vehicle ride and drive day. Most people are unaware of the benefits of driving electric. Offer fleet pricing on EVs (e.g. UCSD has a great program).	CET has a supporting measures to implement educational activities to raise awareness in the public about electric vehicles.
64	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Education programs/workshops for adults/kids/anyone. Possible topics: How it's made, current subsidies, general education.	The current CAP framework includes the following supporting measures in the Building Efficiency strategy: facilitate homeowner and business owner financing of energy efficiency measures by expanding Property Assessed Clean Energy (PACE) financing options, develop and implement a Green Building Incentive Program to promote energy retrofits at home and businesses, educate homeowners about the energy audit process and any applicable incentives and streamline the process of identifying energy auditing contractors, educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
65	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Support policies to update the grid infrastructure.	Energy grid infrastructure is maintained by the local energy utility, SDG&E, and paid for through charges on customer's energy bills. The City will continue to work with SDG&E and advocate for effective maintenance of the energy grid infrastructure when appropriate.
66	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Big incentives for solar on existing buildings, as this is most of the acreage in our city (vs. new buildings).	The Renewable Energy strategy includes a supporting measure to develop and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating at homes and businesses. RE-2 would require new single-family and multi-family homes to install solar photovoltaic (PV) systems. RE-3 would require new and altered commercial buildings to install solar photovoltaic (PV) systems.
67	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Green building program is a great idea. It should involve lots of friendly education for contractors and homeowners starting with the front desk in the building/ permit department.	The updated CAP will include many education and outreach opportunities as supporting measures. For example, the following supporting measures are included in the Building Efficiency strategy: 1) facilitate homeowner and business owner financing of energy efficiency measures by expanding Property Assessed Clean Energy (PACE) financing options, 2) develop and implement a Green Building Incentive Program to promote energy retrofits at home and businesses, 3) educate homeowners about the energy audit process and any applicable incentives and streamline the process of identifying energy auditing contractors, 4) educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region. CAP staff will coordinate with staff in the Planning and Building Department.

68	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	More city wide composting of food waste and use of compost to improve health of soils.	ZW-1 would implement a Zero Waste Program. ZW-1 would implement a Zero Waste Program. The Zero Waste strategy has supporting measures to implement an Organic Waste Recycling Program, facilitate at-home management of food waste through educational workshops and subsidies of compost bins and worm bins, provide free audits of restaurants and grocery stores as to reduce the generation of food wastes, and develop education program for textile recycling. A related supporting measure would adopt practices for turf management which specify the top-dressing of compost to increase carbon sequestration at City parks.
69	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Sell compost bins at street fairs and music festivals.	ZW-1 would implement a Zero Waste Program. The Zero Waste strategy has supporting measures to implement an Organic Waste Recycling Program, facilitate at-home management of food waste through educational workshops and subsidies of compost bins and worm bins, provide free audits of restaurants and grocery stores as to reduce the generation of food wastes, and develop education program for textile recycling.
70	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Employ "411 Food" app to distribute food rather than moving it to waste.	ZW-1 would implement a Zero Waste Program. The Zero Waste strategy has supporting measures to implement an Organic Waste Recycling Program, facilitate at-home management of food waste through educational workshops and subsidies of compost bins and worm bins, provide free audits of restaurants and grocery stores as to reduce the generation of food wastes, and develop education program for textile recycling.
71	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Provide incentives for restaurants and grocery store to use composting services. Votes: 7	The Zero Waste strategy has a supporting measure to provide free audits of restaurants and grocery stores as to reduce the generation of food wastes.
72	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Provide compost bins in all public areas (in addition to trash and recycle bins).	The Zero Waste strategy has a supporting measure to implement an Organic Waste Recycling Program.
73	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Zero Waste education is important. Implement legislation that reduces use of plastic (straws, forks, knives, spoons, to-go containers, cups). Charge for these, give incentives to use paper or bring your own containers. Incentives for local farm to fork restaurants	The Zero Waste strategy has many supporting measures for education and outreach, including implementation of an Organic Waste Recycling Program, facilitating at-home management of food waste through educational workshops and subsidies of compost bins and worm bins, and provide free audits of restaurants and grocery stores as to reduce the generation of food wastes. Restrictions on use of plasticware were considered. Significant emission reductions would not be gained from a plasticware ban or disincentive, rather organic waste is the current focus since emissions from organic waste make up the majority of solid waste emissions.

74	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Provide incentives or tax rebates for water and energy retrofits in existing buildings. Votes: 2	The Building Efficiency and Water Efficiency strategies include supporting measures to develop and implement a Green Building Incentive Program to increase electric vehicle charging at home and businesses, facilitate homeowner and business owner financing of energy efficiency measures by expanding Property Assessed Clean Energy (PACE) financing options, and educate homeowners and businesses about incentive programs offered by SDG&E, CSE, and others in the region.
75	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Landscape all new buildings with BERM and SWALE yard or common space to sequester rainfall and require less watering.	City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.
76	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Incentives, not mandates.	Comment noted.
77	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Develop an effective plan to control rain/waste water so we don't send it all to the ocean.	City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater. OMWD and San Elijo JPA both have recycled water programs and seek to expand recycled water use where feasible. SDWD is evaluating the possibility of adding potable reuse in the future. If this is implemented, a related action could be included in a future update of the CAP.
78	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Use porous paths and sidewalks (less cement) allowing the rain to irrigate soil.	City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater. The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. We track the installation of these BMPs in GIS and could possible account for any benefits.

79	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Replace turf with native landscaping.	<p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. City of Encinitas tracks the installation of these BMPs in GIS and could possible account for any benefits. Capture and reuse is required on most projects not (called Priority Projects in BMP Manual).</p> <p>Additionally, the Clean Water Program, as part of the implementation of the Carlsbad Watershed Water Quality Improvement Program, will implement a residential and property manager incentive program to encourage the voluntary use of Low Impact Design features in residential and commercial landscaping.</p>
80	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Offer incentives for homeowner rain water capture and use.	<p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. City of Encinitas tracks the installation of these BMPs in GIS and could possible account for any benefits. Capture and reuse is required on most projects not (called Priority Projects in BMP Manual).</p> <p>Additionally, the Clean Water Program, as part of the implementation of the Carlsbad Watershed Water Quality Improvement Program, will implement a residential and property manager incentive program to encourage the voluntary use of Low Impact Design features in residential and commercial landscaping.</p>

81	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Ban all single use utensils and Styrofoam.	The Zero Waste strategy has many supporting measures for education and outreach, including implementation of an Organic Waste Recycling Program, facilitating at-home management of food waste through educational workshops and subsidies of compost bins and worm bins, and provide free audits of restaurants and grocery stores as to reduce the generation of food wastes. Restrictions on use of plasticware were considered. Significant emission reductions would not be gained from a plasticware ban or disincentive, rather organic waste is the current focus since emissions from organic waste make up the majority of solid waste emissions.
82	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Provide for absorption of water and rain in the ground instead of runoff into streets, storm, drains and ocean.	City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater. OMWD and San Elijo JPA both have recycled water programs and seek to expand recycled water use where feasible. SDWD is evaluating the possibility of adding potable reuse in the future. If this is implemented, a related action could be included in a future update of the CAP.
83	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Plant shade trees and maintain and care for all existing shade trees.	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs
84	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Work with and incentivize urban farms/ gardens to do carbon sequestration or reduction measure. Votes: 5	CS-1 would develop and implement an Urban Tree Planting Program.
85	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	How much energy does a ficus tree require versus its beneficial sequestration properties?	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs. GHG reductions associated with trees are determined for each species.
86	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Offer scientists/inventors opportunities to develop sequestration prototypes in city facilities. Votes: 1	The City is routinely on the lookout for grant opportunities and regional programs to be a part of that will aid in emissions reductions. The City coordinates with many local and regional Climate Action groups, including some affiliated with local universities. If an opportunity arises to partner with a scientific research team, the City will consider doing so.

87	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Reduce overall turf area in city. Compost trimmings. Votes: 3	<p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. City of Encinitas tracks the installation of these BMPs in GIS and could possible account for any benefits. Capture and reuse is required on most projects not (called Priority Projects in BMP Manual).</p> <p>Additionally, the Clean Water Program, as part of the implementation of the Carlsbad Watershed Water Quality Improvement Program, will implement a residential and property manager incentive program to encourage the voluntary use of Low Impact Design features in residential and commercial landscaping.</p>
88	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Initiate a "plant a tree" program in local schools. Provide each student with a tree to take home and plant in their yard or community. Involve the children in a natural solution to better their community. Funding from grants or fundraisers. Votes: 8	CS-1 would develop and implement an Urban Tree Planting Program, including a supporting measure to partner with schools to educate students about planting trees.
89	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Use compost toilets (with ashes and dry leaves) at city parks. Votes: 1	Maintenance and/or public health concern could make this prohibitive.
90	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Educate citizens about air pollution caused by wood-burning fireplaces and stoves. Votes: 2	Emissions from wood are not included in the Encinitas Inventory, therefore reduction measures related to those emissions cannot be included in the CAP. Also, in its statewide GHG inventory, CARB notes that CO2 emissions from biogenic materials (e.g., ethanol, biodiesel, wood, and landfill or digester gas) would have occurred anyway as the biomass decayed. These CO2 emissions, labeled as being "from biogenic materials", are estimated but not included in California's GHG inventory totals... All CH4 and N2O emissions from combustion of renewable fuels are included in California's GHG inventory.

91	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Solar roads or permeable asphalt.	<p>Solar roads generally are not in widespread use at this time and if the technology becomes feasible and cost effective, it would be considered for inclusion in an updated version of the CAP.</p> <p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. We track the installation of these BMPs in GIS and could possible account for any benefits.</p>
92	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Require new construction to have gas instead of wood-burning fireplaces. Encourage homeowners to convert wood-burning fireplaces to gas.	Emissions from wood are not included in the Encinitas Inventory, therefore reduction measures related to those emissions cannot be included in the CAP. Also, in its statewide GHG inventory, CARB notes that CO2 emissions from biogenic materials (e.g., ethanol, biodiesel, wood, and landfill or digester gas) would have occurred anyway as the biomass decayed. These CO2 emissions, labeled as being "from biogenic materials", are estimated but not included in California's GHG inventory totals... All CH4 and N2O emissions from combustion of renewable fuels are included in California's GHG inventory.
93	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Modify zoning to eliminate future development from areas which may be subject to flooding when sea levels rise. Votes: 3	The city currently has regulations addressing development in floodways and near shore. As maps of floodways and tides lines are adjusted in future years, the City would adjust its building permit requirements. The updated CAP will include a chapter on Climate Adaptation.
94	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Make CAP legally binding. Votes: 8	The City is developing a CEQA qualified CAP that may be used as a programmatic document to assess emissions from new development project applications. The City is currently working on developing a revised Housing Element that can be supported by the community. If warranted, the City will consider using the updated Climate Action Plan as mitigation for environmental impacts potentially caused by the Housing Element update.
95	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Risk assessment for flooding and sea level rise. Retrofit subsidies for high risk area. Consider natural mitigation (increase, fortify, current wetlands). Votes: 3	The updated CAP will include a chapter on Climate Adaptation, which will address future anticipated changes in climate. Plans to address increased flooding and sea level rise are included in this chapter.

96	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Adopt a watershed approach such as Ocean Friendly Gardens to save water and build healthy soil (which sequesters carbon).	The City's Clean Water Program is actively involved in the Carlsbad Watershed Water Quality Improvement Plan development and implementation. As part of this plan, the City will implement a residential and property manager incentive program to encourage use of Low Impact Design features in residential and commercial landscaping. These features would aid in reducing water use, collect and retain stormwater, and enhance soil properties.
97	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Considering climate change and a more arid environment in the coming decades, what are the potential water costs of the new trees if ones chosen are picked for quick growth over water efficiency? Votes: 1	The City's Urban Forest Management Policy addresses selection of tree species for planting. Water use and carbon sequestration are two considerations. CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs.
98	Public Workshops (Feb 21, Mar 3) and Env Commission Meeting (Mar 9)	Look into permeable pavement. It exists. Votes: 3	<p>City of Encinitas has existing stormwater regulations as that require all projects that create and/or replace 500 sq.ft. or more of impervious area to provide natural bioretention best management practices. In addition, all projects are required to preserve natural rainwater storage features (like swales) and design landscaping in such a way to receive and infiltrate rainwater.</p> <p>The BMP Design Manual encourages the use of permeable pavement as a way to reduce stormwater runoff. We track the installation of these BMPs in GIS and could possible account for any benefits.</p>

Category/ Number	Measure	How Comments Are Addressed in Updated Draft CAP Matrix
Transportation Infrastructure		
T-1	Specifies reduction in VMT (%)	CET-1 would call for Complete and implement the City-wide Active Transportation Plan, which is currently underway.
T-2	Specifies target % trips by public transit	See T-1 above
T-3	Specifies target % trips by walking	See T-1 above
T-4	Specifies target % trips by bicycle	See T-1 above
T-5	Specifies reduction of % trips by private auto	See T-1 above
T-6	Allocate transportation funding in same ratio as modal %	No proposed measures or actions.
T-7	Specifies install of specific # of EV Charging stations	CET-4 and CET-5 would require infrastructure or chargers in new construction projects. Supporting measures would complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community and to develop a EV charging plan for municipal facilities. MCET-5 supporting measures calls for new EVCS at municipal buildings.
T-8	Specifies conversion municipal fleet to Zero-Emission	MCET-2 calls for transition to greater mix of alternative, electric, and fuel efficient vehicles.
T-9	Calls for update (or creation) of Bikeway Plan (BMP) + Impl	Bike plan would be part of the Active Transportation Plan in CET-1.
T-10	Calls for update (or creation) of Walk Plan implementation	Walk plan would be part of the Active Transportation Plan in CET-1.
T-11	Specifies Implementation of free or low-cost shuttles	CET-2 would implement a local shuttle system.
T-12	Specifies coordination bet pub transit w/schools & schedules	CET includes supporting measure to pursue partnerships with school districts to increase use of electric school busing
T-13	Mandate Complete Streets design when streets re-surfaced	CET includes supporting measure to develop and implement a Complete Streets Program
T-14	Use Multi-Modal LOS in place of LOS	Will transition to using VMT in place of LOS
Residential Buildings		
R-1	Requires PV solar on new homes	RE-2 would require new single-family and multi-family homes to install solar photovoltaic (PV) system.
R-2	Requires solar thermal on new homes	BE-2 would require new single-family homes to install solar water heater or other efficient technology.
R-3	Requires new homes wired for EV vehicle charging	CET-4 would require new single-family homes to meet the CALGreen single family Residential Voluntary Requirement for electric vehicle charging stations, which would require new homes to have necessary electrical infrastructure for EV charging stations. Require new multi-family homes to install electric vehicle charging stations at 5% of total parking spaces.

R-4	Requires reduction in energy use per unit by 2020 (%)	BE-1 would require energy audits of existing residential units for modifications, alterations, and additions that require building permits. BE-3 adopts energy efficiency standards for new commercial buildings and modifications, alterations, and additions.
R-5	Requires reduction in energy use per unit by 2035 (%)	BE-1 would require energy audits of existing residential units for modifications, alterations, and additions that require building permits. BE-3 adopts energy efficiency standards for new commercial buildings and modifications, alterations, and additions.
R-6	Calls for CCA Feasibility Study, with RFP and contract dates	RE-1 would establish a CCA program. A related supporting actions seeks to develop RFP and allocate funds for CCA feasibility study. Funds for a technical study are being requested in the FY17-18 budget proposal.
R-7	Mandates allocation of funds for CCA feasibility study	A related supporting actions seeks to develop RFP and allocate funds for CCA technical feasibility study.
R-8	Supports Property-Accessed Clean Energy (PACE) financing	A supporting action in several strategies seeks to facilitate homeowner and business owner financing of renewable energy systems by expanding Property Assessed Clean Energy (PACE) financing options.

Non-Residential Buildings

Q-1	Requires incentives for PV solar on existing NR buildings	Will offer incentives through the Green Building Incentive Program, a supporting measure to several building-related actions.
Q-2	Requires PV Solar on new NR buildings above a certain size	RE-3 would require all new commercial buildings and modifications, alterations, and additions >10,000 sq ft to install solar photovoltaic (PV) system.
Q-3	Requires EV charging stas at new NR bldgs above some size	CET-5 would require new and altered commercial buildings to install electric vehicle charging stations at 8% of total parking spaces.
Q-4	Requires cool roofs on new NR buildings	2016 Title 24, Part 6 includes requirements for the thermal emittance, three-year aged reflectance, and Solar Reflectance Index (SRI) of roofing materials used in new construction and re-roofing projects.
Q-1	Requires SEMMS on new NR buildings	The CAP would require Smart Energy Monitoring and Measurement Systems on new and existing municipal building over 5,000 square feet.
Q-2	Specifies Zero-Net Energy Target for municipal buildings	MRE-1 would offset all electricity consumption at municipal facilities with onsite renewable energy to become "Net Zero Electricity" municipal operation.
Q-3	Specifies that new municipal buildings shall be ZNE	This would be addressed by MRE-1.

Urban Infrastructure

U-1	Calls for diversion of solid waste from landfill	ZW-1 would implement a Zero Waste Program with goals to divert 65% of solid waste by 2020 and 80% by 2030.
U-2	Specifies capture of landfill emissions (ie methane)	City of Encinitas does not own any landfills and would not have control over decisions to capture landfill gas.
U-3	Specifies urban tree planting, with schedule	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs
U-4	Specifies institution of an Urban Tree Planting Program	CS-1 would develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs. CS includes a supporting measure to complete and implement an urban forest management policy.

Water		
W-1	Specifies capture of methane from wastewater treatment	SEJPA currently captures some methane.
W-2	Specifies impl of price tiers to promote H2O conservation	Current rates are tiered. WE-2 would continue water rate studies and implement new water rates as planned.
W-3	Specifies per capita reduct in water use (%) by 2020	Performance metrics associated with the Water Efficiency Strategy and associated Goals include performance metrics for 2020 and 2030.
W-4	Specifies per capita reduct in water use (%) by 2035	Performance metrics associated with the Water Efficiency Strategy and associated Goals include performance metrics for 2020 and 2030.
W-5	Specifies incentives to reduce irrigation	A supporting measure under the Water Efficiency strategy would offer incentive programs for reduced indoor water consumption and in landscaping.
W-6	Specifies recycled H2O at parks, golf courses, medians	Related supporting measures under the Water Efficiency strategy would (1) conduct audits and retrofit all municipal facilities with water efficient features to reduce potable water use at municipal facilities and (2) increase outdoor landscape reclaimed water use at city parks, open space, and other municipal facilities.

City of Encinitas Climate Action Plan Update

Potential GHG Reduction Measures

Poster Voting Results from Public Workshops held on
February 21, March 1 and Environmental Commission Meeting on March 9

Transportation & Gas-Powered Equipment	Votes
Revise City parking standards to promote biking, walking, and transit.	5
Update the City's Circulation Element to improve traffic flow and reduce GHG emissions.	8
Complete and implement the City-wide Active Transportation Plan to increase opportunities for biking, walking, and riding transit.	20
Develop and implement a Complete Neighborhood Program to reduce the need to drive to routine goods and services.	10
Transition the City fleet to a greater mix of alternative, electric, and fuel efficient vehicles.	9
Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of Zero-Emission vehicles by the community.	16
Design and deploy a local shuttle system to increase travel by public transit.	30
Coordinate with regional transit authorities and local school districts to improve public transit options.	21
Develop and implement a Complete Streets Policy to improve biking and walkability.	11
Complete Safe Routes to Schools projects to decrease need to drive students to school.	8
Reduce mowing at City parks by replacing turf with other plant materials wherever possible.	9
Adopt a Leaf Blower Ordinance to limit use of gas powered blowers.	14

Electricity & Natural Gas	Votes
Require solar photovoltaic (PV), solar water heating, and Electric Vehicle (EV) chargers on new residential and commercial buildings.	19
Develop and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating, electric vehicle charging and other energy efficiencies at home and businesses.	25
Install solar PV on municipal facilities to become a Zero Net Energy City .	17
Retrofit municipal facilities with energy efficient features.	6
Convert City streetlights, signals, and outdoor lighting to LED .	9
Develop a Community Choice Aggregation Program or similar program with a goal of increasing the mix of renewable energy offered to residents and businesses.	44
Facilitate homeowner and business owner financing of energy efficiency measures by offering more Property Assessed Clean Energy (PACE) financing options.	4

Solid Waste**Votes**

Adopt legislation for Organics Management that goes beyond the requirements of AB 1826.	18
Facilitate at-home management of food waste through educational workshops and subsidies of compost bins and worm bins.	16
Provide free audits of restaurants and grocery stores as to reduce the generation of food wastes.	16

Water**Votes**

Implement and enforce Title 24 Green Building Standards which include installation of water efficient appliances in all new buildings.	16
Offer incentive programs for reduced water consumption in landscaping.	11
Develop and implement a Water and Energy Conservation Ordinance to require water efficient appliances in existing buildings.	6
Increase reclaimed water use at city parks, open space, and other municipal facilities.	12
Retrofit all municipal facilities with water efficient features.	7

Carbon Sequestration**Votes**

Develop and implement an Urban Tree Planting Program , including standards to right-size trees and minimize pruning and irrigation needs, to increase carbon sequestration, and decrease the energy required for cooling.	38
Adopt practices for turf management which specify the top-dressing of compost to increase carbon sequestration at City parks.	17



Results

Survey 10594

Number of records in this query:	55
Total records in survey:	55
Percentage of total:	100.00%





Field summary for 01

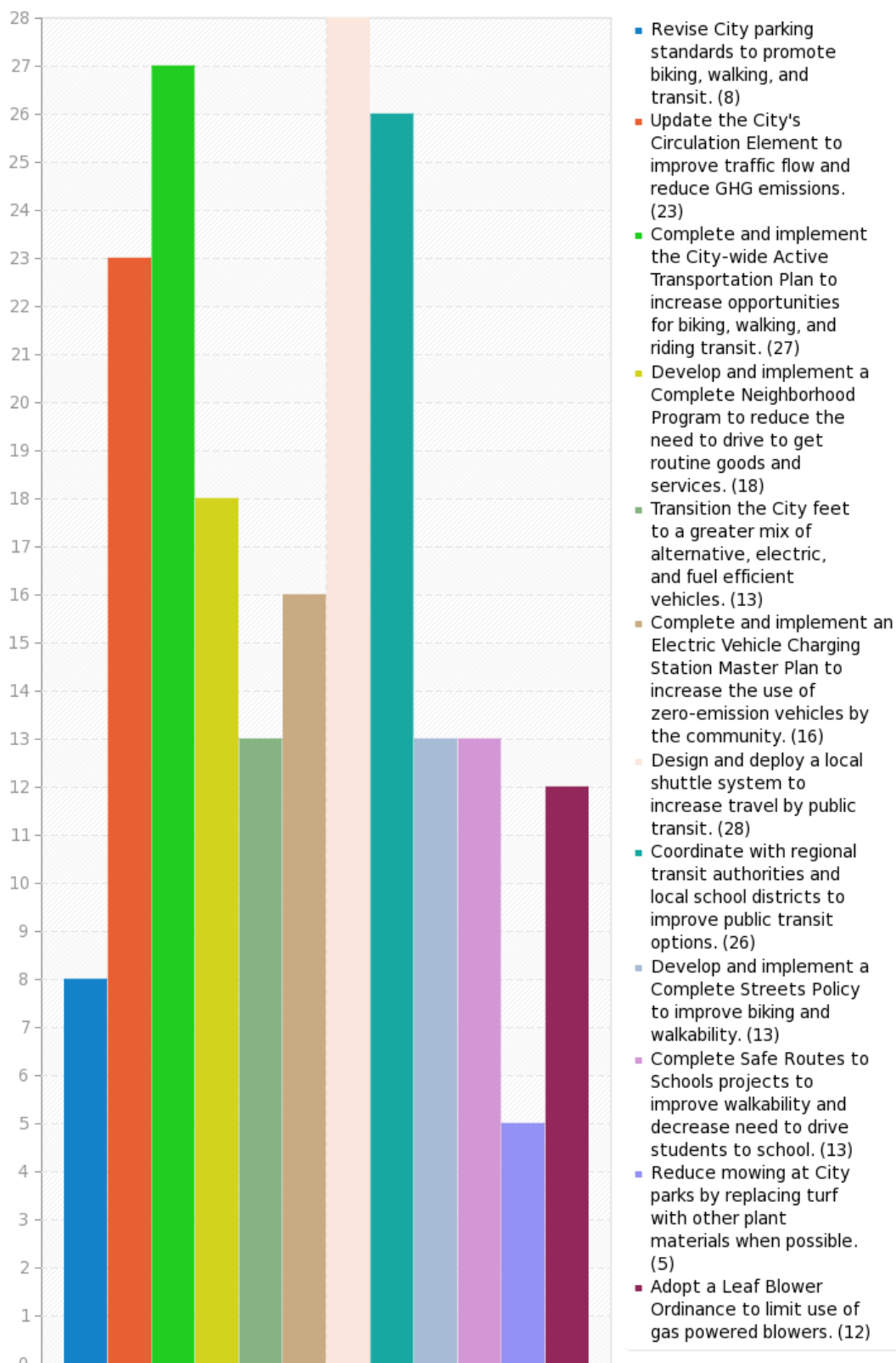
Transportation related greenhouse gas emissions make up more than half of the City's contribution to climate impacts. Reducing these emissions may take the deployment of a handful of policies, programs, and projects. Please review the following list of options and select the top four measures that you think the City should employ.

Answer	Count	Percentage
Revise City parking standards to promote biking, walking, and transit. (1)	8	14.55%
Update the City's Circulation Element to improve traffic flow and reduce GHG emissions. (2)	23	41.82%
Complete and implement the City-wide Active Transportation Plan to increase opportunities for biking, walking, and riding transit. (3)	27	49.09%
Develop and implement a Complete Neighborhood Program to reduce the need to drive to get routine goods and services. (4)	18	32.73%
Transition the City fleet to a greater mix of alternative, electric, and fuel efficient vehicles. (5)	13	23.64%
Complete and implement an Electric Vehicle Charging Station Master Plan to increase the use of zero-emission vehicles by the community. (6)	16	29.09%
Design and deploy a local shuttle system to increase travel by public transit. (7)	28	50.91%
Coordinate with regional transit authorities and local school districts to improve public transit options. (8)	26	47.27%
Develop and implement a Complete Streets Policy to improve biking and walkability. (9)	13	23.64%
Complete Safe Routes to Schools projects to improve walkability and decrease need to drive students to school. (10)	13	23.64%
Reduce mowing at City parks by replacing turf with other plant materials when possible. (11)	5	9.09%
Adopt a Leaf Blower Ordinance to limit use of gas powered blowers. (12)	12	21.82%



Field summary for 01

Transportation related greenhouse gas emissions make up more than half of the City's contribution to climate impacts. Reducing these emissions may take the deployment of a handful of policies, programs, and projects. Please review the following list of options and select the top four measures that you think the City should employ.





Field summary for 02

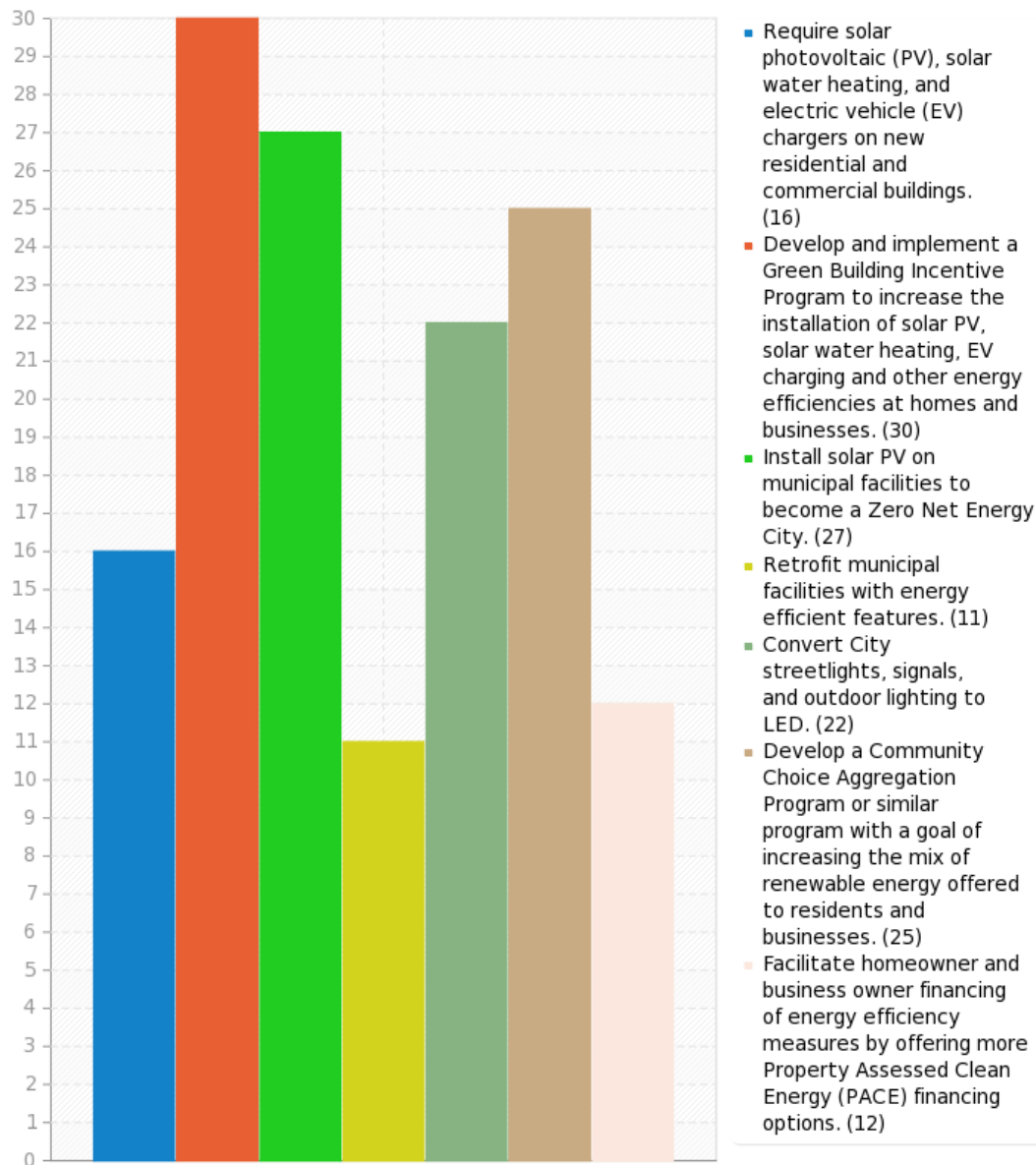
Electricity and Natural Gas related emissions make up a combined 37% of the City's contribution to climate impacts. The primary source of these emissions comes from the energy produced in residential and commercial buildings. Improvements in the way buildings are designed, constructed, and managed can reduce these emissions. Please review the following list of options and select the top three things the City should do.

Answer	Count	Percentage
Require solar photovoltaic (PV), solar water heating, and electric vehicle (EV) chargers on new residential and commercial buildings. (1)	16	29.09%
Develop and implement a Green Building Incentive Program to increase the installation of solar PV, solar water heating, EV charging and other energy efficiencies at homes and businesses. (2)	30	54.55%
Install solar PV on municipal facilities to become a Zero Net Energy City. (3)	27	49.09%
Retrofit municipal facilities with energy efficient features. (4)	11	20.00%
Convert City streetlights, signals, and outdoor lighting to LED. (5)	22	40.00%
Develop a Community Choice Aggregation Program or similar program with a goal of increasing the mix of renewable energy offered to residents and businesses. (6)	25	45.45%
Facilitate homeowner and business owner financing of energy efficiency measures by offering more Property Assessed Clean Energy (PACE) financing options. (7)	12	21.82%



Field summary for 02

Electricity and Natural Gas related emissions make up a combined 37% of the City's contribution to climate impacts. The primary source of these emissions comes from the energy produced in residential and commercial buildings. Improvements in the way buildings are designed, constructed, and managed can reduce these emissions. Please review the following list of options and select the top three things the City should do.





Field summary for 03

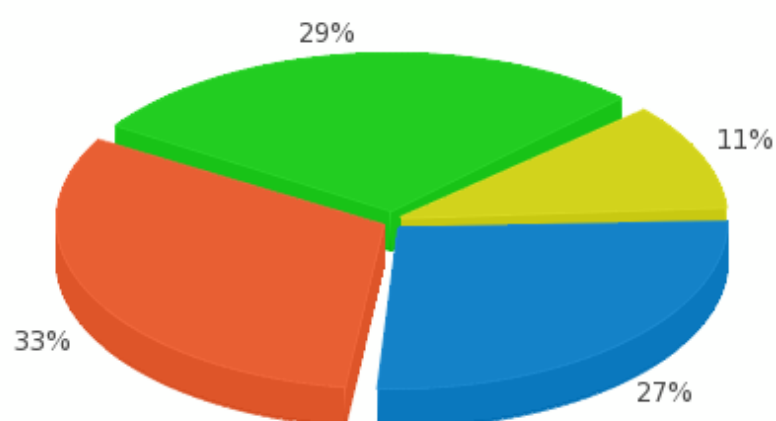
Solid Waste related greenhouse gas emissions make up 5% of the City's contribution to climate impacts. Reducing the generation of solid waste and diverting waste from the local landfills would decrease these emissions. What policy or program should the City put in place to help curb solid waste emissions? Select one.

Answer	Count	Percentage
Adopt legislation for Organics Management that goes beyond the requirements of AB 1826. (1)	15	27.27%
Continued facilitation of at-home management of food waste through educational workshops and subsidies of compost and worm bins. (2)	18	32.73%
Provide audits of restaurants and grocery stores to reduce the generation of food wastes. (3)	16	29.09%
No answer	6	10.91%
Not completed or Not displayed	0	0.00%



Field summary for 03

Solid Waste related greenhouse gas emissions make up 5% of the City's contribution to climate impacts. Reducing the generation of solid waste and diverting waste from the local landfills would decrease these emissions. What policy or program should the City put in place to help curb solid waste emissions? Select one.



- Adopt legislation for Organics Management that goes beyond the requirements of AB 1826. (15)
- Continued facilitation of at-home management of food waste through educational workshops and subsidies of compost and worm bins. (18)
- Provide audits of restaurants and grocery stores to reduce the generation of food wastes. (16)
- No answer (6)



Field summary for 04

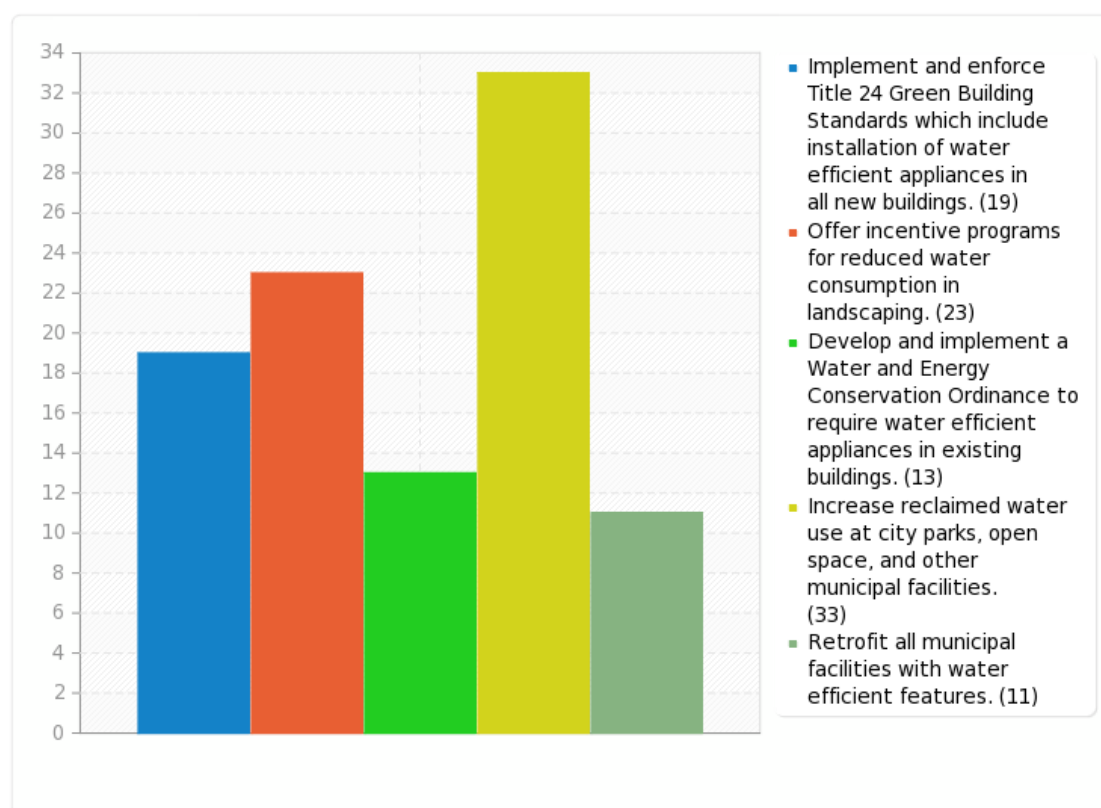
The energy needed to deliver potable water to the community makes up 3% of the City's contribution to greenhouse gas emissions. Water conservation measures employed by residents and businesses would also contribute to a reduction in energy. What top two actions should City take to help reduce water related emissions?

Answer	Count	Percentage
Implement and enforce Title 24 Green Building Standards which include installation of water efficient appliances in all new buildings. (1)	19	34.55%
Offer incentive programs for reduced water consumption in landscaping. (2)	23	41.82%
Develop and implement a Water and Energy Conservation Ordinance to require water efficient appliances in existing buildings. (3)	13	23.64%
Increase reclaimed water use at city parks, open space, and other municipal facilities. (4)	33	60.00%
Retrofit all municipal facilities with water efficient features. (5)	11	20.00%



Field summary for 04

The energy needed to deliver potable water to the community makes up 3% of the City's contribution to greenhouse gas emissions. Water conservation measures employed by residents and businesses would also contribute to a reduction in energy. What top two actions should City take to help reduce water related emissions?





Field summary for 05

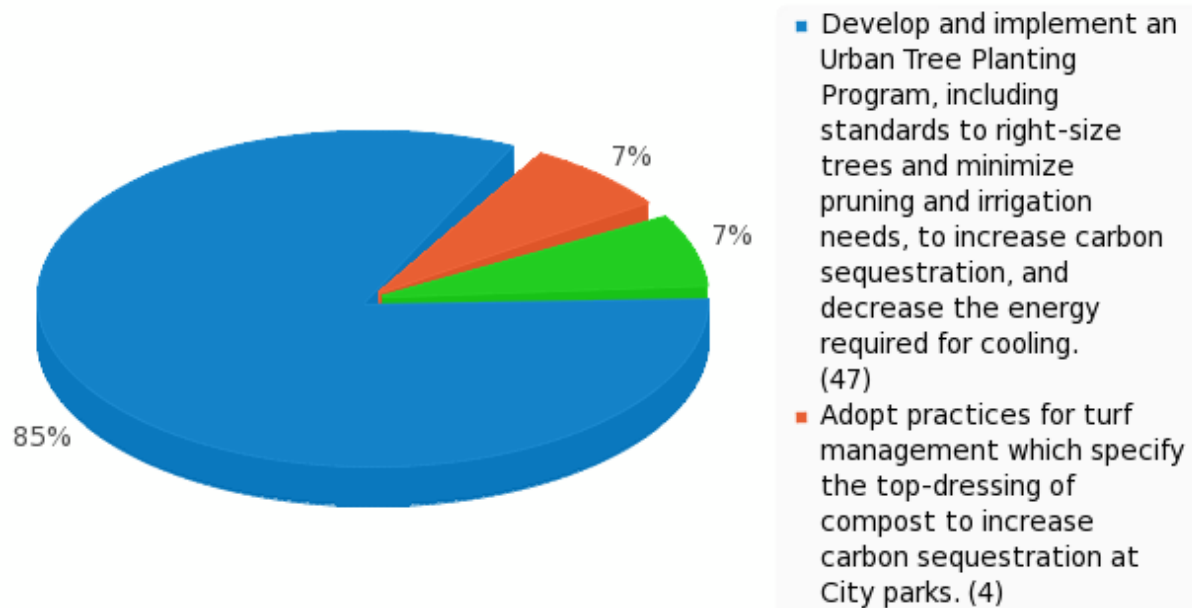
Trees and other vegetation take up CO₂ as part of their daily photosynthesis process. Managing City parks and trees to improve carbon sequestration could aid in reducing the community's overall greenhouse gas contribution. Of the following measures, which one do you think the City should implement to sequester carbon?

Answer	Count	Percentage
Develop and implement an Urban Tree Planting Program, including standards to right-size trees and minimize pruning and irrigation needs, to increase carbon sequestration, and decrease the energy required for cooling. (1)	47	85.45%
Adopt practices for turf management which specify the top-dressing of compost to increase carbon sequestration at City parks. (2)	4	7.27%
No answer	4	7.27%
Not completed or Not displayed	0	0.00%



Field summary for 05

Trees and other vegetation take up CO₂ as part of their daily photosynthesis process. Managing City parks and trees to improve carbon sequestration could aid in reducing the community's overall greenhouse gas contribution. Of the following measures, which one do you think the City should implement to sequester carbon?





Field summary for 06

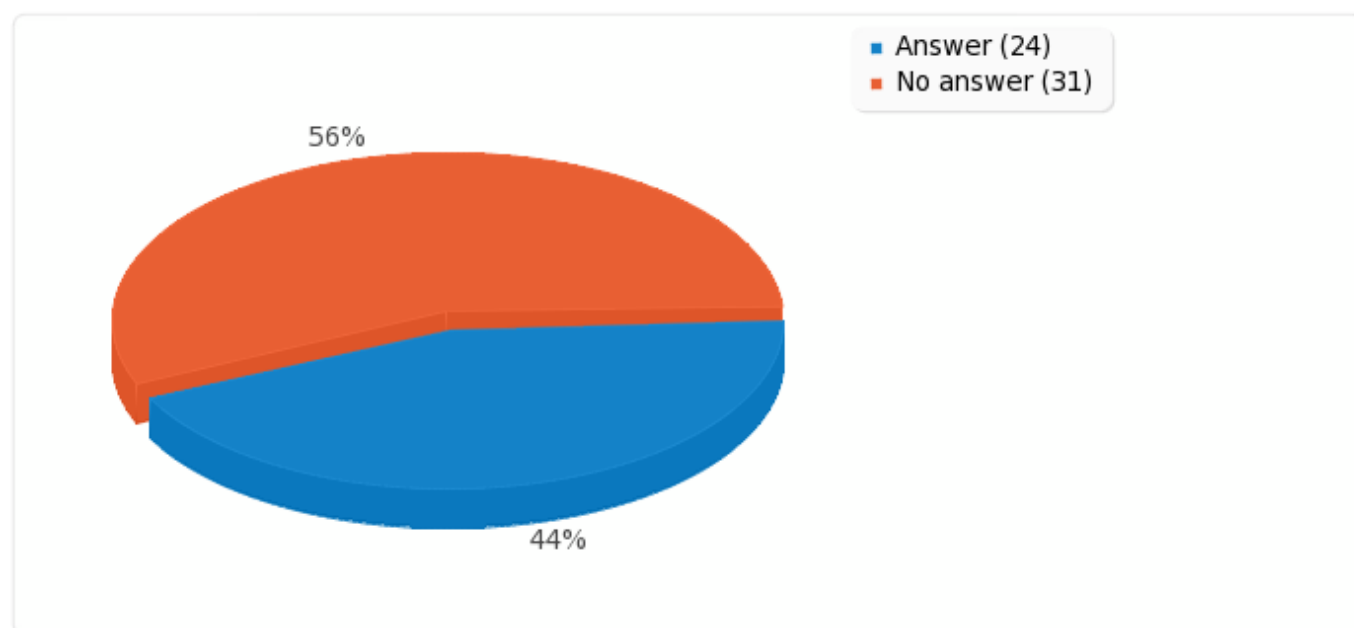
Are there any other emissions reduction measures not listed in this survey that you think the City should consider?

Answer	Count	Percentage
Answer	24	43.64%
No answer	31	56.36%
Not completed or Not displayed	0	0.00%



Field summary for 06

Are there any other emissions reduction measures not listed in this survey that you think the City should consider?



Commenter	Comment Subject	Comment	Response
Doug Fiske	Population	Unless we greatly reduce world population, anything else we do will have no effect on climate change. Think globally, act locally.	Comment on population is outside of scope of the City's CAP.
Dave Perryman	Climate Science	<p>• I'm surprised that the underlying assumption of the plan is that climate change is human caused (increased GHG's) and that it is, by definition, a negative thing. This theory of the cause for climate change is just that – theory. There are many other competing theories. True science allows all competing theories to be impartially investigated to be proven or disproven. Your CAP should not take sides in this debate. The myth that “97% of scientists” believe the man-caused theory to be true has been debunked. It's not only false but also completely irrelevant to any science-based argument. Also, the “settled science” argument is ludicrous on its face as anyone trained in science knows that this end-state is never truly reached in any branch of science but certainly not in a branch as immature as Climate Science. Remember, for several hundred years, 99.99% of scientists believed Newton had “settled” the science of physics until a guy named Einstein came along. I believe a more moderate approach, one that recognizes that there is significant scientific uncertainty in any qualitative - let alone quantitative – conclusions relative to the cause(s) of climate change and any potential future magnitude/impact, would be more appropriate for a document intended to represent the views of all the residents of Encinitas, not just those of the environmental lobbyists.</p> <p>Section 5.1.1 is an example of grossly irresponsible and one-sided projections of potential impact of any future climate change. The projection of quantitative impacts (e.g., increases in average high and low temperatures stated to 0.1 degrees F or the number of “hot” days) is ridiculous and significantly beyond the capability of any current climate models or other projection methods. In its current form, this section amounts to nothing more than thinly-veiled “scare” tactics. I expect these from the environmental lobbyists but not from a City Staff supported by my tax dollars which should represent the opinions of all the residents of Encinitas. Also, there is a significant body of evidence that increased CO2, while not significantly increasing Earth's average temperature, will be beneficial. Current levels of CO2 are well below “optimum” and increases will result in increased plant growth leading to a reduction in famine and an increase in living standards for many on the Planet. By presenting only negative potential effects and not any of the positive ones, you present an extremely biased document.</p>	Climate science used in the CAP is sourced from the Intergovernmental Panel on Climate Change (IPCC) and peer-reviewed scientific journal articles, each of which have review and vetting processes to ensure only the most current and accurate science is used in publications.
	Adaptation vs. GHG Reduction	• Considering the above, I believe there should be more emphasis on vulnerability, resiliency and adaptation to climate change (Sections 5.2 and 5.3) rather than the implementation of a whole new bureaucracy to monitor CO2 when it has yet to be scientifically proven that it is the primary or even a significant driver of climate change.	Chapter 5 focuses on vulnerability, resiliency, and adaptation. See response to previous comment related to climate science.
	Cost Benefit Analysis	• I believe that the biggest deficiency of the draft CAP is that it does not provide a cost/benefit analysis. The City Council and City Staff have a fiduciary responsibility to the residents of Encinitas to let them know how much the implementation of this plan will cost and what benefits will be obtained. By benefits, I don't mean the reduction in CO2 and other stated secondary goals of the plan but an actual prediction of the impact on climate change. How many degrees of warming will be avoided or cooling achieved if the plan is implemented? If you believe you can accurately predict the increase in average high and low temperatures to 0.1 degrees F, then surely you can also predict the overall impact of the plan on average global temperature. This will allow each resident the ability to gauge for themselves if the plan represents a good value for their tax dollar expenditures. While section 5.1 talks around this issue, it seems to present only the “worst case” for each of the IPCC scenarios discussed, as opposed to the “most likely case”. Considering that the majority of Americans barely include climate change in their ranking of their top 20 concerns, I believe this “value for money” issue is an important metric that should be presented to the residents of Encinitas.	Administrative costs to the City will be provided in the CAP Implementation Plan. The Implementation Plan will also identify a detailed cost-benefit analysis as a future action. Impacts under the “worst case scenario”, in which little is done to reduce global greenhouse gas emissions, are included in the CAP and are based on climate projection data in the Cal-Adapt software. Both a low emissions and “worst case” high emissions scenarios are included in the CAP to provide a conservative planning scenario, based on climate modeling. Climate modeling at a local level to predict global changes in temperature is not feasible.
	Litigation Risk	• Even though the “goals” of the plan are stated as being non-binding (at least I believe that to be the case), I'm concerned that this plan will expose the City to law suits from over-zealous environmental lawyers/lobbyists if these goals are not met. How certain is City Staff that this will not happen? In addition to the obvious cost of the plan addressed in the previous bullet, this legal exposure represents a hidden and potentially significant cost associated with the plan.	CEQA review is being conducted to assess environmental impacts of the CAP. Litigation risk to the city is a consideration of any action the City takes and has been taken into account during the development of the CAP.
Jim McCook	Climate Science	<p>Dear Climate Action Committee</p> <p>It's disappointing to me that anyone would assume there is a shred of proof to this section of your plan. It's 100% false, the product of corrupt non-science, and is NOT assumed to be true by the many climate scientists and institutions that are not subsidized by government funding. Too many people have been drinking the poison Kool-Aid. You mean well, and may think you're doing a good thing, but it's based on ignorance and corruption.</p> <p>As an average American, I can only follow what is written and spoken about this very technical subject by experts on both sides of the heated issue. We all follow the ones that make the most sense and seem to be telling the truth. The answer is obvious.</p> <p>As one excellent explanation for my comments, please take the time to study this document, written by one of the credible atmospheric scientists, Richard Lindzen:</p> <p>http://merionwest.com/2017/04/25/richard-lindzen-thoughts-on-the-public-discourse-over-climate-change/#more-2835</p> <p>Sincerely, Jim McCook, DDS, ret. Encinitas</p>	Climate science used in the CAP is sourced from IPCC and peer-reviewed scientific journal articles, each of which has review and vetting processes to ensure only the most current and accurate science is used in publications.
Nancy Andon	EPA Link	1. On the front page of the plan, there is a link to the EPA's climate page. Given that this page (and indeed all climate action) has been pulled by the current federal administration, might I suggest the link be updated to the archived EPA climate page, currently posted on the City of Chicago website: http://climatechange.cityofchicago.org/	The EPA link on the City's Climate webpage is currently working. The City's IT Department monitors website functionality and links are updated when necessary.
	Urban Forest/Permaculture	2. Regarding increased net tree plantings as a means of carbon sequestration, might I suggest these plantings will be more successful (and therefore save the city money in the long term) if planted as part of a permaculture plant guild that naturally builds healthy soil which can hold more carbon and help raise the local water table. Permaculture techniques (also known as regenerative agriculture or regenerative gardening) are taught, for example, at our own Coastal Roots Farm.	During planning and implementation of this measure permaculture techniques will be considered.
	Outreach with Schools	3. Community outreach, especially at our local elementary schools, might include teaching simple permaculture (regenerative gardening) principles, for example during gardening class, or as a one-time science class. We might even encourage a small area of the school grounds to be set aside as a “food forest” to display these techniques, as the schools do now with their vegetable gardens and pollinator gardens. Learning these techniques allows interested community members to sequester carbon in their own backyard, and encourages greater food security for families. Also it's fun.	City is coordinating with school district(s) to implement CAP measures and outreach to schools. Permaculture will be considered.
Stan Cole	Roads	Why isn't more time and money spent on our roads instead of stuff that only a few people believe in.	Intent of the CAP is to achieve GHG reductions consistent with State targets. Other portions of the City budget are allocated to road improvements.

Commenter: Sempra Services Corporation

Comment Subject	Comment	Response
Balance between emission sources	<p>The draft CAP recognizes that in 2012 the transportation sector was responsible for approximately 54% of the city's emissions while the electricity sector accounted for 23% of those emissions.</p> <p>Although only 23% of the City's emissions came from electricity while 54% come from transportation in 2012, the primary emphasis of draft CAP measures is on the electricity sector, with relatively few reductions targeted at the primary source of emissions, the transportation sector. A well-designed CAP would be expected to reflect a mix of emission reduction measures that is similar in proportion to the emission sources that are subject to that CAP. However, as the following table summarizing GHG reductions from proposed CAP strategies demonstrates, that is not the case in the Encinitas draft CAP, which only seeks to achieve relatively few emission reductions in the transportation sector.</p> <p>It is not reasonable to adopt a goal of targeting 10 times more emission reductions from the source of 23% of emissions than the source of 54% of emissions. Transportation is the source of well over two times more GHG emissions than the electricity sector, yet would receive scant attention under the draft CAP. In fact, by 2030, clean transportation would only account for about 3% of the emission reductions targeted therein. On its face, it is apparent that a plan that would target only 3% of total emission reductions from the source of 54% of GHG emissions reflects little, if any, attention to the largest source of GHG emissions in the City of Encinitas.</p> <p>The lack of balance in emission reduction strategies is evidence of the need for a regional dialogue to obtain input on all available options, and of the need to ensure that all options in all sectors are fully considered in order for the CAP to focus on those measures that will achieve the greatest benefits at the lowest cost.</p>	<p>Reduction measures in the CAP reflect the degree of control the City can exercise over emissions sources. Measures and actions were chosen based on their feasibility and effectiveness in achieving GHG reductions.</p> <p>The CAP recognizes significant GHG emissions reductions from federal and state transportation regulations and initiatives. Much of the GHG reductions in the transportation sector are linked to a cleaner electricity supply. As transportation technology advances and new measures become feasible, future CAP updates will consider additional measures focused on transportation sector emissions reductions. Reductions targets identified in the CAP are based on overall emissions, not individual sectors, consistent with State guidance.</p>
To the Extent CAP Measures Focus on Electricity, They Should be Designed to Result in Real and Additional Emission Reductions	<p>The Draft CAP identifies CCA as an appropriate strategy for increasing renewable energy supply for homes and businesses. CCA by itself does not result in any emission reductions. In the energy industry, emission reductions come from reducing demand (EE) or displacing dirtier energy with cleaner energy. This can be done by CCA, DA, or utility procurement. What matters is what is procured, not who procures the energy.</p>	<p>The CAP sets goal of achieving 100% renewable electricity by 2030 which would reduce emissions. Currently, CCAs are the only mechanism by which cities may directly determine the proportion of renewable energy offered in their jurisdiction. See additional responses related to CCA below.</p>
Real and Additional Emission Reductions Can Only be Achieved by Reducing Energy Demand or Generating More Power with Lower Emitting Resources	<p>The only way renewable procurement (whether by a CCA provider, utility, or any other entity) will result in additional GHG reductions is if that procurement actually leads to additional renewable generation construction. Any CCA program that relies on short-term contracts with existing resources or RECs will not result in additional GHG reductions. To the extent that it moves demand that would have been served by a utility under long-term contract to a provider that will rely on short-term contracts instead, it may even result in reduced emission reductions.</p> <p>Under the existing CAISO market structure, renewable resources will generate electricity whenever the renewable resource is available (i.e., solar generation generates electricity whenever it is sunny, wind generation generates electricity whenever it is windy). This is because the CAISO runs on the basis of security constrained least cost economic dispatch, which basically means that the resource with the lowest cost that can be physically dispatched to load will run. The sun and wind are free, while the input fuel for a natural gas plant has a cost. Put another way, renewable resources have a variable cost of approximately zero.</p> <p>As the United States Department of Energy has explained to Congress, because renewable resources have a very low marginal cost, they are run whenever they can be physically dispatched to load:</p> <p>"Generally, system operators accept as much electricity as possible from renewable resources, regardless of whether it is utility or non-utility generation, because of its low cost and only curtail reliance on these sources when forced to by limits on transmission availability or reliability considerations. Most wind and solar generation units are not dispatchable in the traditional sense (i.e., cannot be precisely controlled by the grid operator), but their output is accepted as must-run or must-take production."</p> <p>(See, U.S. Department of Energy, 2011/2012 Economic Dispatch and Technological Change, Report to Congress, September 2012, at p. 4, https://energy.gov/sites/prod/files/2014/12/f9/2011-2012-EconomicDispatch-TechChange-RptCongress.pdf.)</p> <p>Whether an existing renewable resource has a contract with a load-serving entity or not, it will run. Given this, contracting with an existing resource only determines who will get credit for renewable generation that will already occur, but such a contract would not have any meaningful impact on how much renewable energy is generated. If a contract with an existing resource is at above-market rates, rather than resulting in incremental emission reductions, it will merely export wealth from San Diego to other areas without creating any incremental environmental benefit.</p> <p>Under these circumstances, it is clear the only way to increase the amount of renewable energy production is to increase the amount of renewable generation that exists. New renewable generation will only be constructed with adequate assurance of investment recovery/return, which generally requires a long-term contract. As a result, if the goal of a CCA proposal is to achieve additional GHG emission reductions through renewable power, its renewable procurement must be pursued through long-term contracts that will lead to additional renewable generation construction and additional emission reductions.</p>	<p>The CAP calls for a CCA Technical Feasibility Study, which will explore the constraints and opportunities related to electricity procurement and associated GHG reductions.</p>
Experience to Date in California Shows that CCA is Unlikely to Result in Additional Renewable Construction in the Foreseeable Future	<p>An analysis of the procurement practices of CCA providers in California to date based on information obtained from the California Energy Commission (CEC) supports an assumption that CCA would meet its renewable energy needs through procurement primarily from out of state resources on a short-term basis. In that regard, the chart set forth below illustrates where CCA providers in California have obtained their energy to date. The following shows that only a very small amount of renewable energy has been procured by CCA providers from new renewables developed to meet CCA demand.</p> <p>As the following chart illustrates, experience also shows that when CCA providers purchase energy from existing resources, most of those resources are not even in California.</p> <p>If CCA is not designed to procure renewable energy through long-term contracts that result in new renewable generation construction or through direct investments in renewable generation construction, CCA will not result in real or additional emission reductions, will not result in additional renewable generation, and will not result in any job creation. The CAP can only achieve real and additional emission reductions in the energy industry by constructing new renewable resources to meet energy demand subject to the CAP - whether CCA can satisfy that goal depends entirely on how CCA is designed.</p> <p>A CCA program that fails to meet its renewable energy needs through renewable power generated by facilities that are newly constructed to meet its renewable energy demand cannot achieve real and additional emission reductions in the energy industry. Unfortunately, this has largely been the experience with CCA in California to date. While CCA may or may not be the best way for the City to achieve real and additional emission reductions in the energy industry, the City of Encinitas has failed to conduct any meaningful analysis to ascertain whether this is or is not the case.</p>	<p>See response to previous comment regarding the proposed CCA Technical Feasibility Study. The experience of existing CCAs will be evaluated as part of the study.</p>
Conclusion	<p>Because Sempra Services shares the goal of Encinitas to reduce emissions, we believe that the City should consider all available options, join in a broader and regional dialogue to maximize local and regional benefits, and only implement a strategy that is designed to achieve real and additional emission reductions. By considering all available emission reduction opportunities, the city will be able to maximize environmental and economic benefits while minimizing unnecessary costs and risk through implementation of its CAP.</p> <p>To the extent emission reductions are pursued through renewable energy procurement by a CCA, the CCA program should be designed to lead to the development of new clean energy projects and new jobs. Short-term contracting from existing energy resources will not result in incremental GHG emission reductions or job creation. Sempra Services believes the best decisions will come from a vigorous and transparent dialogue that considers all available input and all options so that real and additional emission reductions can be achieved in the most cost-effective manner and residents can count on the clean and reliable energy that they deserve, without greater financial risk. We appreciate this opportunity to submit our views on how to best accomplish these objectives.</p>	<p>The City of Encinitas is actively engaged in regional climate action planning and welcomes the opportunity to coordinate regionally to achieve CAP goals, reduce emissions, develop new clean energy projects and create clean energy jobs.</p>

Commenter: Climate Action Campaign

Comment Subject	Comment	Response
Renewable Energy Recommendation 1: Include a 100% Clean Energy Goal	The CAPs of the cities of San Diego, Del Mar, and Solana Beach commit to 100% clean energy by the year 2035. In addition, as noted previously, California Senate Leader Kevin de León has introduced legislation to transition the entire state to 100% clean energy by 2045. We recommend updating Strategy 2 to read "Achieve 100% Renewables by 2030." By embracing a 100% clean energy future, Encinitas joins the ranks of major cities around the globe pushing towards 100% clean energy. Locally, such a commitment would signal a region-wide shift to renewables. We're pleased to see Community Choice Aggregation included as a tool to increase renewable energy supply and reduce emissions at the local level. Furthermore, we commend Encinitas for engaging with Del Mar, Carlsbad, and Oceanside to coordinate a joint CCA feasibility study. However, it is important to identify and quantify how strategies beyond CCA will help power Encinitas with 100% renewable energy by 2030. Such strategies include quantification of clean energy provided from rooftop solar and municipal energy projects.	The CAP includes a performance metric of 100% renewable electricity supply and 80% customer participation by 2030. This would support a goal to achieve 100% renewable energy by 2030. Goal 2.1 will be changed to "Achieve 100% renewable energy supply in Homes and Businesses"
Clean and Efficient Transportation Recommendation 2: Clarify Mode Share Targets for Walking, Biking, and Transit	Currently, the city actions listed under Goal 4.1: Reduce Vehicle Miles Travelled, of Strategy 4: Clean and Efficient Transportation, include implementing a local shuttle system and an incomplete city-wide Active Transportation Plan. Although we have been told by city staff the Active Transportation Plan won't be completed in time be included and quantified in the CAP, we recommend the city update the CAP upon its completion to incorporate its reduction potential. Furthermore, we recommend clarifying the performance metrics in Goal 4.1 to 1) state the percent to which the alternative commute rate (combined transit, walking, and biking) will increase, and 2) specify mode share targets that would enable the city to meet its overall alternative transportation targets. Planning in a way that is inclusive and welcoming for your community members who may rely on alternative transportation will enhance quality of life in Encinitas, mitigate GHG emissions, and improve air quality. Articulating mode share goals clearly allows the development of aligned strategies to ensure goals are met. Mode share goals also help municipalities plan and budget to facilitate a shift away from car-centric growth, promote multi-modal commutes, as well as advocate for assistance for better transit infrastructure. Finally, they can also help communities plan for anticipated or desired health outcomes. Planning for all transportation modes should be paired with planning for a variety of types of housing, so the community can be diverse, inclusive, and more reflective of the wider swath of the American Community.	The City is preparing an Active Transportation Plan (ATP) that will provide mode share data and quantification. The ATP will be integrated into the CAP once complete. The CAP currently does not assign such goals as it would be speculative without a focused study through the ATP. The CAP demonstrates that reduction targets would be achieved through currently identified measures.
Social Equity, Smart Growth & Jobs Recommendation 3: Include Social Equity & Jobs Section	Sustainability is often described as a "three legged stool", where economic prosperity, ecological integrity, and social equity are the pillars required to achieve a community that is able to sustain itself. Too often, social equity is a critical component that is forgotten. We recommend the Draft CAP incorporate a social equity section to achieve a sustainable future that is equitable. Climate Action Campaign encourages the city to consider the extensive transit that runs through Encinitas, connecting people to job centers from San Diego to Los Angeles. Encinitas is a critical node in this transit corridor that is likely to expand to include double tracking and high-speed rail. To allow and sustain transit ridership, there needs to be adequate housing, including affordable housing, within a short distance of stations. We encourage Encinitas to make the high quality of life the city affords its current residents more accessible to people of diverse socio-economic strata by increasing the affordable housing stock and locating those homes near jobs and transit. We recommend the CAP include measures to support infill and transit-oriented development that supports high-density housing while reflecting the community's history and character. Otherwise, Encinitas is destined to be a city where car-centric transportation prevails and transit merely passes through instead of connecting people to jobs in the region. Lastly, we recommend including language to ensure climate action-related developments created by city programs include prevailing wages and work with apprenticeship programs to ensure workers from around the region benefit equitably from projects in built in Encinitas. The city can also encourage local businesses working on climate action-related projects and programs to give advanced notice of job opportunities to Encinitas community members through local community-based organizations, educational institutions, and media outlets.	A section that considers social equity and incorporates social equity issues into the implementation of the CAP will be added to Chapter 4: Implementation and Monitoring.
Implementation & Monitoring Recommendation 4: Include Detailed Timeline and Cost Analysis for Each Strategy	We are pleased with the first iteration of the Draft CAP's implementation and monitoring plan as it includes a designated implementation coordinator and a high-level implementation strategy matrix with a general timeline and cost estimate for each city action. We recommend including a more detailed timeline with a system to prioritize implementation of each strategy, as well as a cost analysis for each strategy. This level of detail is critical for public accountability of the CAP's success and will ensure the city sets sufficient budgeting and staffing levels at the appropriate time. Finally, we are pleased with the status of the CAP monitoring report plan and we recommend the city publish a CAP implementation progress report annually and a GHG inventory at least every three years. We applaud Encinitas for creating an online portal for the CAP, and we recommend using this platform to publish progress in order to allow the public to gauge progress made on CAP strategies, determine if the city is on track to meet GHG targets, and assess if adjustments are needed.	Administrative costs to the City will be provided in the Implementation Plan being prepared for the CAP. A detailed cost-benefit analysis will be identified as next step needed after completion of the Implementation Plan. The Implementation Plan will provide timelines and implementation steps for CAP actions and supporting measures. Monitoring reports will be produced every two years and the Climate Dashboard will provide updates on progress in the interim.

Commenter: Surfrider Foundation

Comment Subject	Comment	Response
Water Conservation Measures	Water Conservation Measures	The mix of water sources varies in a given year. Each year, the water districts source and use all possible local water before resorting to water transported from outside the region.
	Requesting targets, timelines, and goals for water conservation mechanisms to be used for Goal	The update of the CAP included evaluation of the most effective projects, programs and policies that the city could implement to reduce GHG emissions across all sectors. The city and the local water districts do not have direct control over the energy used to transport water from outside the region. The city's most effective and feasible leverage to reduce GHG emissions in the water sector is water conservation.
	Add more goals to address the energy-water nexus In Goal 3.1 Reduce City-wide Potable Water Consumption, City Action WE-1 Complete Water Rate Study and Implement New Water Rates	See response above.
Water Conservation Supporting Measure (Specific Comments)		
Language Changes	Change "Evaluate the feasibility of a SDWD potable water reuse project" to: • Conduct a potable water reuse feasibility study to commence in 2018 to estimate economic costs, constituent preferences and constituent acceptance, similar to the 2016 study for Ventura Potable Reuse.	SDWD completed a potable reuse feasibility study in 2016. Can change supporting measure to: "Evaluate key challenges that were identified in the 2016 SDWD Potable Reuse Feasibility Study."
Language Changes	Change "Increase outdoor landscape reclaimed water use at city parks, open space, and other municipal facilities" to • Increase the percentage of current municipal landscape using reclaimed water to 100%. • Reduce total amount of water needed for municipal landscaping by transitioning vegetation to drought-resistant native plants, and other methodologies currently practiced for Ocean Friendly Gardens.	Can change supporting measure to "Convert all current municipal landscape adjacent to recycled water pipelines to recycled water. Look for opportunities to work with the San Elijo Joint Powers Authority to extend reclaimed pipelines to additional municipal facilities, when economically viable."
Language Changes	Change "conduct audits and retrofit all municipal facilities with water-efficient features to reduce potable water use at municipal facilities" to • Conduct audits on all municipal facilities to quantify current water use and opportunities for water savings through the implementation of water-efficient features by December 2018. Retrofit all current municipal facilities, and require all new municipal facilities, to be built with water-efficient features to reduce potable water use by December 2019.	Implementation timelines are discussed in Chapter 4 of the CAP. An Implementation Plan is currently being developed to supplement the CAP and the timelines proposed here will be considered.
Proposed Goal	Propose Goal 3.2 – Reduce energy required for treatment, transport, and distribution of potable water • Reduce the amount of water used during energy generation by incorporating more renewable energy into the grid. • Source water from least-cost sources first, including the potential development of a local or nearby potable water reuse facility.	Bullet #2 will be added to CAP as supporting measure. Renewable energy goals are covered under strategy 2 of the CAP.
Language Changes	Strategy 2: Change "Expand and/or improve the water reclamation efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts" to o Expand and/or improve the water reclamation efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts to ensure that all current and future city landscaping can source the majority of landscaping water needs from reclaimed sources.	Feasible to change Ch. 5, Strategy 2 to "Expand and/or improve the recycled water efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts to ensure that, when economically viable, all current and future city landscaping can source the majority of landscaping water needs from recycled sources."
Proposed Change	Strategy 3: "Work with relevant water agencies including SDCWA, OMWD, and SDWD to evaluate current and future water supply systems and vulnerabilities and how water resources may be impacted by climate change." o Please provide more details on this including deadlines for what types of studies would occur and when.	More detail on the coordinated efforts of the city, SDCWA, OMWD, and SDWD, including possible studies and timelines, will be provided in the Implementation Plan.
Water Conservation Measure Change	Strategy 4: "Develop a marketing and outreach program to promote participation in existing water conservation rebate and incentive programs in the region. Current programs for southern California include Water Smart San Diego (SDCWA), SoCal WaterSmart (Metropolitan Water District), and SDWD's free sprinkler nozzle program." o Please ensure that these programs do not promote artificial turf, and instead focus on mechanisms of Ocean Friendly Gardens, including the planting of native drought resistant plants and a landscape design that promotes natural water catchments. Ocean Friendly Gardens also promote healthy soil, which can aid in carbon sequestration.	All program rules and requirements are evaluated and implemented by the organization that runs each program. SDWD and OMWD have partnered with Surfrider in the past on an Ocean Friendly Garden Project.
Water Conservation Measure Change	Strategy 5: "Expand upon the City's existing Water Efficient Landscape Regulation to promote the use of climate appropriate landscaping (e.g., xeriscaping) to reduce demand for potable water resources among City residents. Promote current funding available through the Save Our Water Turf Replacement Rebate Program sponsored by DWR." o Please state how much funding is currently available.	It is not guaranteed that funding through DWR's Save Our Water program will continue to be available, and the amount of funding may vary from year to year. SDWD and OMWD will continue to promote all rebates and incentives that are available to our customers.
Information requested to be included in CAP		
Freshwater Information	The amount of freshwater used for electricity generation for the City.	The City does not have jurisdiction or control over the amount of water used in electricity generation. This is managed by the local energy utility, SDG&E. Strategy 1 and 2 of the CAP address energy related actions and measures.
Freshwater Information	The amount of freshwater that comes from each source for the City.	For each water district, the proportion of water from each source can vary significantly from year to year. Each district provides an itemization of their supply portfolio in their Urban Water Management Plan. In addition, source water information can be found and is required to be reported annually in the Consumer Confidence Report.
Freshwater Information	The greenhouse gas emissions associated with each source of freshwater.	GHG emissions associated with each source of water were estimated in Appendix A: Greenhouse Gas Emissions Inventory and Projections.
Freshwater Energy Information	How the transition to renewable energy will affect the greenhouse emissions associated with water treatment, transport, and distribution.	The GHG reduction estimates in the CAP account for the increase in renewable electricity supply. As the electricity supply becomes cleaner, the emissions associated with all aspects of the water cycle decline.

Comment Subject	Comment	Response
Introduction to Climate Change Science	<p>We appreciate the material in the Draft on this important topic. However, CEQA requires that negative environmental impacts be fully and accurately described. That standard should be applied to the Final CAP.</p> <p>Under the principle of cumulative impacts, if Encinitas should fail to do its part, as described in the Final CAP, to achieve climate stabilization at a livable level, the outcome that must be fully described is climate destabilization. The Draft must fully explain the urgency and danger of humanity's anthropogenic climate change crisis, which we will sometimes refer to a simply "climate".</p> <p>The best way to do this would be to include plots and explanations of the plots, to leave no doubt about the validity and grave nature of climate.</p> <p>Figure 1 shows the rise of the world's atmospheric CO2 over the last 50 years.</p> <p>Figure 2 shows both atmospheric temperature (averaged over a year and averaged over all of the earth, derived from an isotope analysis) and atmospheric CO2, over 800,000 years. (Our species is only around 300,000 years old.) Figure 2 shows that when climate deniers say that climate is always changing and so therefore climate change is normal, they are correct, except for one important consideration. There is nothing normal about the outrageous run up of atmospheric CO2, to over 400 PPM, in such a short time that it appears to be an instantaneous spike, on Figure 2. There is no doubt that the spike is the result of our combustion of fossil fuels. The spike is clearly anthropogenic climate change.</p> <p>Figure 3 covers all of the time of the development of our civilization. By focusing on just 1000 years, the spike's shape, in red, is revealed. Everything was normal until about 150 years ago, which is the start of our industrial revolution, when we started to burn fossil fuels. The ominous increase in temperature (in blue) is also shown. By doing extensive calculations we know how much CO2 we have produced from the combustion of fossil fuels. Then, by directly measuring the atmospheric CO2 and the acidity of the oceans, we know where all of that CO2 currently resides. We also know that atmospheric CO2 traps heat. There is no doubt that we have an Anthropogenic Global Warming (AGW) catastrophe in the making. Achieving climate-stabilizing targets is our only hope.</p>	<p>The CEQA document for the CAP will address environmental impacts of the CAP itself.</p> <p>Climate science and reductions needed to achieve climate stabilization are addressed in the CAP.</p> <p>CAP targets are consistent with State guidelines and milestone years.</p> <p>Chapter 4 proposes CAP updates every five years to address evolving technology, State legislation, and climate science.</p>
Need to Fully Explain Humanity's Climate Predicament	<p>The "environment" is composed of various important features of the physical world, including our own species. Impacts on these features may or may not be reasonably well predicted by how the Draft performs relative to California's climate mandates, such as AB 32, SB 32, the driving reduction targets of SB 375, and Executive Orders S-3-05 and B-30-15. In any case the Final CAP performance must be evaluated to show compliance or non-compliance with the state's climate mandates. Certainly, under the principal of cumulative impacts, failure to achieve the above-listed mandates will, it must be assumed, lead to climate destabilization and a resulting catastrophe. Climate destabilization must be clearly explained so that decision-makers understand what is at stake.</p> <p>The Final CAP must also show compliance or non-compliance with achieving "climate-stabilizing targets", where "climate-stabilizing targets" means targets that will, considering cumulative impacts, prevent "climate destabilization". Briefly, "climate destabilization" is shorthand for having the world go through a so-called climate tipping point. Going through a tipping point herein means that the warming feedbacks become dominant and our planet's climate changes into one which will no longer support most of its current life forms, including our own species.</p> <p>The June, 2008 issue of Scientific American wrote of a "devastating collapse of the human population", due to anthropogenic global warming if there is insufficient reductions in our greenhouse gas (GHG) emissions. This is one outcome of "climate destabilization." To avoid this, anthropogenic emissions must first be reduced enough to stop the level of atmospheric CO2 from continuing to increase. This needs to happen as soon as possible. If it happens too late, we could still suffer a "devastating collapse of the human population", regardless of our actions, after the warming feedbacks become dominant. The Final CAP must explain both "stabilizing the climate at a livable level" and "climate destabilization."</p> <p>The Final CAP must identify the most significant impact of all: the extinction of humanity, which would come about if we fail to achieve climate-stabilizing targets. Identifying such effects as more fires, more hot weather, and some amount of sea-level rise, while useful, is insufficient under CEQA law.</p> <p>Reference 1 is the result of two resolutions that were (both) adopted by the Democratic Club of Carlsbad and Oceanside (DEMCCO) and the San Diego County Democratic Party Central Committee (SDCDPCC). The first one is "Climate Literacy for High School Students"; the second one is "Climate Literacy for Elected Officials." The California Nevada Regional Conservation Committee (CNRCC) of the Sierra Club California (SCC) has adopted a very similar resolution. The California Democratic Party (CDP) Resolutions Committee has recommended Reference 1 for approval, by the CDP. It is therefore expected that Reference 1 will be adopted by the CDP at its next Convention. The FEIR needs to ensure that it will provide the information needed to help its readers become climate literate.</p> <p>The Final CAP could play a role in increasing climate literacy, for public officials, if the Final CAP sufficiently explained the full danger.</p> <p>Humanity must, as Governor Brown said to the Pope, "reverse course or face extinction." Covering up this stark reality violates CEQA law, which calls for a reasonable disclosure of likely harm, for the case of insufficient mitigation.</p>	<p>CAP targets are established based on State legislation and is consistent with the 2017 Draft Scoping Plan from CARB, addressing the 2030 target. This interim target is a milestone towards ultimately achieving climate stabilization.</p> <p>Climate stabilization is addressed in Chapter 2.</p> <p>Chapter 4 establishes a CAP update timeline of every five years to address evolving technology, State legislation, and climate science.</p> <p>The CEQA document for the CAP will be prepared consistent with State CEQA Statute and Guidelines and will disclose impacts of the CAP.</p> <p>Appropriate background information will be included consistent with CEQA requirements, however, the express intent of this CEQA document is not to address climate literacy as the comment states. Information on climate science is provided in Chapters 1, 2, and 5 of the CAP.</p> <p>Educational opportunities related to the CAP are discussed in Section 4.3 Ongoing Engagement.</p> <p>References in CAP allow readers to explore further the climate science and State policies discussed in the plan.</p>
Plan for Success	<p>Adopting targets, achieving targets, and doing greenhouse gas inventory is meaningless unless the work, in conjunction with state and local efforts, achieves climate-stabilizing targets. If the work does that, then the decision makers can happily sign off on the Final CAP. If the work fails to do this, many decision makers will want the work to be improved by the inclusion of more and stronger mitigation measures. We appreciate and applaud your showing the importance of cars and light duty trucks, or "Light Duty Vehicles" which we will refer to as "LDVs". Except for one short section near the end of this letter, we will restrict our comments to how the CAP needs to be improved, regarding LDVs, compared to the Draft. We will place our emphasis on reducing vehicle miles travelled (VMT). Most California planners understand that (LDVs) emit the most GHG emissions. The category (LDVs) will not achieve the state's climate mandates (Executive Order S-3-05 and SB 32), let alone achieve climate-stabilizing targets (which may require larger GHG emission reductions than the state's climate mandates), without reducing VMT.</p> <p>Since driving is such a large emitter of GHG, in order to evaluate the Final CAP, there will have to be reasonable assumptions about what California will do regarding LDV fleet efficiency and what California will do regarding adopting an improved method for having Californians pay for the use of our roads, since that will have a significant effect on per-capita driving. You would be reasonable if you were to assume that the state will adopt policies to reduce vehicle-miles travelled (VMT) by cars and light-duty trucks, or "Light-duty vehicles" (LDVs), but only if you make it clear to the state exactly how much help you will need. Recognizing that predicting LDV's VMT is primarily the City's responsibility, because writing an accurate Final CAP is City's responsibility, it becomes obvious that the City must either find and identify or write a plan showing how LDVs can achieve climate-stabilizing targets. On-road transportation causes 47% of the GHG emissions in San Diego; cars and light-duty trucks cause 41%. Encinitas must attempt to partner with the state. The state should take the lead on fleet efficiency and the "road-use charge" ("RUC", as shown in the work to implement SB 1077). Encinitas must take the lead on achieving the needed per-capita driving, assuming the state's RUC, which should help to reduce VMT. Your primary controls on VMT include land use, complete streets, active-transportation facilities, transit systems, car-parking policies, and teaching adults how to safely ride a bicycle in traffic. The political party that is the majority political party in both California and San Diego County takes the explicit position that many of the above statements are true. For example, the California Democratic Party (CDP) platform (Reference 2) advocates for the following:</p> <p>"... a state plan showing how cars and light-duty trucks can hit climate-stabilizing targets, by defining enforceable measures to achieve the needed fleet efficiency and per-capita driving" Reference 3 is such a state plan. SANDAG, CARB or some other entity could write such a plan, which could then be used as a reference document in your EIR. Encinitas could use Reference 3 or it could use a modified version of Reference 3. One of these alternatives would then be the Encinitas prediction as to how LDVs could achieve climate-stabilizing targets. It has often been said that having no plan to succeed is having a plan to fail. Encinitas staff must not trick the Encinitas Council into choosing failure because there is no plan. Encinitas staff must instead show the Council how to succeed and how to fail and then let the Council decide, with the public fully informed so they can react to the Council choice in the next election. This is fundamental to CEQA law. Besides CEQA law, given that our survival hangs in the balance, a plan is mandatory. There also is no other way to comply with CEQA, since decision makers must be shown specifically how the worst environmental outcome could be avoided. Since not stabilizing the climate is an unacceptably bad outcome, it is imperative that the Plan's EIR show how cars and light-duty trucks could achieve climate-stabilizing targets. Again, the dominant political party in our state is aware of this fairly-obvious reality. From Reference 2: Demand Regional Transportation Plan (RTP) driving-reduction targets, shown by science to support climate stabilization. A Requirements Document, such as Reference 3, is a necessary part a Final CAP.</p>	<p>The CAP targets are established based on State legislation and are consistent with the 2017 Draft Scoping Plan from CARB, addressing the 2030 target.</p> <p>Chapter 2 describes how future CAP updates would incorporate future targets, including a 2050 target, and revised reduction measures to meet the future targets. At this time, the 2030 target aligns with State guidelines.</p> <p>Comment implies that light duty vehicles (LDVs) need to achieve climate stabilization goals in and of themselves. Targets are based on all combined emissions, not on individual subsectors.</p> <p>CAP addresses LDV VMT reductions through measures outlined in Chapter 3, including updates to Circulation Element, increased EVs, and pending Active Transportation Plan.</p>
Criteria for Including Identified Mitigation Measures	<p>How will Encinitas decide which suggested mitigations (ways to reduce GHG emissions) will be ignored and which ones will be implemented? CARB's updated Scoping Plan says that all mitigations should be implemented if they are "technologically feasible and cost effective". Any weaker criterion will violate CEQA law. The Final CAP needs to be clear on that point. It needs to apply this criterion to all of the identified mitigation measures, including those in this letter.</p>	<p>The CAP includes a suite of actions and supporting measures to achieve identified reduction targets. Actions and measures were selected based on the degree of City control, magnitude of reductions achieved, and feasibility of implementation.</p> <p>The term "mitigation measures" is used erroneously in this comment. CAP measures are not CEQA mitigation measures. The CEQA document for the CAP will address potential environmental impacts of the CAP. Actions and measures to achieve proposed GHG reduction targets are identified in the CAP, not in the CEQA document.</p>
The CAP's Relationship with "Senate Bill 375"	<p>SB 375 will help meet AB 32. AB 32's explicit target is for year 2020 and to achieve the 1990 emission level in that target year. The importance of that target is less than the targets after 2020, which are as follows:</p> <ul style="list-style-type: none">• 40% below the 1990 level by 2030, from SB 32; and from Executive Order B-30-15• 80% below the 1990 level by 2050, from Executive Order S-3-05;• a reasonable climate-stabilizing target, which is 80% below the 1990 level by 2030, as shown in Reference 3 <p>If CARB gives a 2035 target that is not climate-stabilizing, that fact would not relieve Encinitas of its responsibility to figure out how cars and light-duty trucks can achieve a reasonable climate-stabilizing target, for the reasons provided in the above section of this letter.</p> <p>The Final CAP needs to show exactly how the needed driving reductions could be achieved. The next section provides help in this regard.</p>	<p>SB 375 targets are incorporated into the VMT modeling provided by SANDAG, which is based on projected growth in the City.</p> <p>SB 375 does not supersede a local jurisdiction's land use authority.</p>

Commenter: Sierra Club

Comment Subject	Comment	Response
Reallocate SANDAG Funds Earmarked for Highway Expansion to Transit and Consider Transit-Design Upgrades	<p>It is well-known that the induced traffic demand resulting from adding highway lanes will cause traffic congestion to remain constant. This is true, even if the new lanes are HOV (High Occupancy Vehicle) lanes; HOT (High Occupancy Toll) lanes; or Managed Lanes, which give priority to moving transit vehicles. Any project (or other change, such as autonomous vehicles that can travel at high speeds with very little distance between vehicles) that temporarily creates space on a freeway will induce enough traffic to fill that space, returning congestion to the level it was before the project (or other change.) Therefore, additional lanes will not reduce congestion one iota. The money spent to add lanes is not just a waste of money. With more lanes and the same level of congestion as before, the result is always more frustrated drivers, more air pollution, and more GHG emissions.</p> <p>The sales tax measure called "Trans-Net" allocates approximately one-third for highway expansion, one-third for transit, and one-third for road maintenance. It has a provision that allows for a reallocation of funds, if supported by at least two-thirds of SANDAG Board members, including a so-called weighted vote, where governments are given a portion of 100 votes, proportional to their population. This feasible mitigation measure is to reallocate the Trans-Net amount, earmarked for all highway expansions, to transit. It is noted that perceived political risk for decision makers does not constitute infeasibility, for a suggested mitigation measure.</p> <p>SANDAG needs to help educate the public about the futility of adding lanes because of induced traffic demand, as well as our responsibility to have a plan showing how cars and light-duty trucks can achieve climate-stabilizing targets. This will reduce political risk.</p> <p>This money could be used to fund additional transit systems; improve transit operations; and/or redesign and implement the redesign of an existing transit system. A redesign could be the electrification and automation, or even a wholesale technology upgrading of the Coaster/AMTRAK and Sprinter rail lines. These systems need to be frequent and operate 24/7.</p> <p>The money could also be used to implement a fixed-guideway connection between the San Diego Airport and both the Santa Fe Train Station and the Old Town Transit Center. A trade-off study is needed to find out if this should be done with a trolley extension or an automated system, perhaps using the technology that connects the Oakland Airport to the Coliseum BART station.</p> <p>Encinitas needs to assume this mitigation measure and then do everything it its power to convince the SANDAG Board that it must be done. (AB 805 would help.)</p>	<p>The recommendations in this comment are not City actions and would need to be considered/implemented by SANDAG.</p> <p>The City will coordinate with SANDAG where appropriate.</p>
A Comprehensive Road-Use Charge (RUC), Pricing-and-Payout System to Improve the Way We Pay for the Use of Roads	<p>Comprehensive means that, for example, pricing, overall, is sufficient to cover all costs, including road maintenance and externalities such as harm to the environment and health; privacy is defined and achieved; the economic interests of low-income drivers doing necessary driving would be protected; that the incentive to drive fuel-efficient cars would be at least as large as it is under the current fuels-excise tax; and, as good technology becomes available, congestion pricing is used, if needed, to protect critical driving from congestion.</p> <p>The word "payout" means that some of the money collected would go to people that are losing money under the current system.</p> <p>Currently, user fees (gas taxes and tolls) are not enough to cover road costs. Even though general-fund money is being used to operate and maintain roads, California is not doing maintenance with enough frequency to minimize cost. It is well understood that deferred maintenance will cost more than timely maintenance.</p> <p>Besides this, the improved mileage of the Internal Combustion Engine vehicles (ICEs) and the large number of Zero-Emission Vehicles (ZEVs), both of which are needed to have the fleet efficiency required to achieve climate mandates, mean that gas-tax revenues will drop precipitously over the coming years. In view of these facts, California has passed and is implementing SB 1077, which creates a pilot project road user charge (RUC). The Road User Charge Technical Advisory Committee (RUC TAC) has twice visited San Diego. The first time, they met in the SANDAG Board Room. The second time, they met at the CALTRANS District 4 office. SANDAG Board Members and SANDAG staff were conspicuously absent from these meetings. SANDAG staff did not inform its Board of these meetings.</p> <p>This is unfortunate because a RUC is the future of road funding. Unfortunately, the SANDAG Board Majority seems to think that a new sales tax can be used to expand roads. The recent defeat of Measure A suggests that this is not true.</p> <p>Both SANDAG and Encinitas need to support California in its efforts to create an effective RUC pricing-and-payout system. As the pilot project finishes, legislation is needed to get the design and implementation moving. SANDAG and Encinitas should lobby for a good system and then, in their EIRs, they should assume a good system. Such a system will play a useful role in reducing per-capita driving.</p>	<p>Recommendations in this comment are not within the City's jurisdiction.</p> <p>The City will support the State and SANDAG where appropriate when their actions align with the City's goals and vision. A supporting measure will be added to the CAP to reflect the City's current commitment to tracking State legislation and lobbying for change when it aligns with City goals and vision.</p>
Improving the Way We Pay for the Use of Car Parking	<p>Bundled-cost parking increases the cost of everything, from rent to food; bundled-benefit parking reduces wages. These unsustainable practices are economically unfair to those that drive less or might like to drive less, if they could receive the fair, market-priced compensation for their effort, considering the high cost of providing parking. Surface parking only provides spaces at a rate of 120 car-spaces per acre of land. Parking garage construction costs are over \$20,000 per space. Underground parking costs from \$60,000 to \$100,000 per space. The fourth bullet of the Transportation Sub-plank of the 2016 California Democratic Party Platform (Reference 2) calls for "shared, convenient and value-priced parking, operated with a system that provides earnings to those paying higher costs or getting a reduced wage, due to the cost of providing the parking."</p> <p>This feasible mitigation was ignored by the County in their legally-deficient Climate Action Plan (CAP) which they subsequently rescinded under court order. This is the mitigation measure that was described during oral arguments in Appellate Court, when a Justice asked the Club to describe a feasible mitigation measure that was ignored by the County.</p> <p>After hearing the description, the Justice commented, "That sounds like feasible mitigation to me."</p> <p>Here is a brief description of this feasible mitigation measure. It is modified to be for Encinitas. This strategy would be a "game-changer", not only for Encinitas, but for improving our prospects for achieving climate-stabilizing targets, wherever driving is a significant source of GHG emissions and so-called "free parking" at work is common.</p>	<p>The CAP demonstrates how the City will meet identified targets based on the selected reduction measures.</p> <p>Parking measures were considered but not included in favor of other more effective, feasible measures identified in the CAP</p>
Demonstration Project to Eliminate the Harm of Bundled-Benefit Parking at Work	<p>Encinitas would develop a Demonstration Project to, in effect, Unbundle the Benefit of Parking ("Demonstration Project") at City Hall ("Proposed Location").</p> <p>BACKGROUND: Currently, Encinitas employees do not have the ability to choose between earnings and driving – employees effectively pay for parking out of their salary, whether or not they use the parking. The Demonstration Project will provide the opportunity for the employees to choose between earnings and driving. This is functionally equivalent to the implementation of the California Air Pollution Control Officers Association (CAPCOA) measure of unbundling the cost of parking.</p> <p>PROJECT: Parking would be charged at a given rate (for example \$0.02/min – roughly \$10.80/day, considering 8 hours of work and 1 hour for lunch). Funds generated from these parking charges would be distributed as earnings to all employees working at the proposed location in proportion to each employee's time spent at work, at the proposed location. Those who decide not to drive will not be charged for parking but will still make earnings based on their time spent at work at the location. Implemented correctly, this free-market approach will substantially reduce vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions, by reducing the drive-alone mode.</p> <p>For employees whose parking charges are greater than their parking lot earnings, an "add-in" may be included so that no employee loses money, compared to "free parking". (Some documentation of this method refers to this payment as a "must-drive bonus".) With such "add-in" payments, there could be an "Opt in" or "Opt out" choice, meaning that those that "Opt out" will see no changes on their pay check, relative to "free parking".</p> <p>This project may be helped by receiving a grant to pay the development and installation cost, as well as the "add in" payments, for some specified number of years. Oceanside would need to apply for such a grant.</p> <p>This feasible mitigation measure is actually a demonstration project of a full system implementation, as described in Reference 4. Reference 5 is a more detailed description of this demonstration project.</p> <p>Based on Table 1 of Reference 4, the driving reduction could be 25%, at places of employment. Table 1 shows driving reductions resulting from introducing a new price differential for parking, for 10 cases. Its average reduction in driving is 25% and its smallest, single-case reduction is 15%. Again, these systems can be set up so that no driver loses money. Grant possibilities include the California Air Resources Board's Low Carbon Transportation program and the Strategic Growth Council's (SGC's) Transformative Climate Community program. Reference 6 has more detail on the SGC grant program.</p>	<p>See previous response related to parking.</p>
Good Bicycle Projects and Bicycle Traffic Skills Education	<p>The best criterion for spending money for bicycle transportation is the estimated reduction in driving per the amount spent. It is hoped that the following strategies will come close to maximizing this important parameter.</p> <p>1.) Projects to Improve Bicycle Access</p> <p>All of the smart-growth neighborhoods, central business districts, and other high trip destinations or origins, both existing and planned, should be checked to see if bicycle access could be substantially improved with either a traffic calming project, a "complete streets" project, more shoulder width, or a project to overcome some natural or made-made barrier.</p> <p>League of American Bicyclist Certified Instruction of "Traffic Skills 101"</p> <p>Most serious injuries to bike riders occur in accidents that do not involve a motor vehicle. Most car-bike accidents are caused by wrong-way riding, riding on sidewalks, and errors in intersections; the clear-cut-hit-from-behind accident is rare.</p> <p>After attending Traffic Skills 101, students that pass a rigorous written test and demonstrate proficiency in riding in traffic and other challenging conditions could be paid for their time and effort.</p> <p>As an example of what could be done in San Diego County, if the average class size was 3 riders per instructor and each rider passes both tests and earns \$100 and if the instructor, with overhead, costs \$500 dollars, for a total of \$800 for each 3 students, that would mean that \$160M could teach \$160M/\$800 = 200,000 classes of 3 students, for a total of 600,000 students. This is approximately 20% of the population of San Diego County. If a significant percentage of the graduates become every-day, utilitarian riders, this program will be a very cost-effective mitigation measure. It is certainly technologically feasible.</p> <p>If SANDAG is uninterested in doing this program countywide, Encinitas could scale the program described above down to a City-run program. Members of Oceanside's Bicycle-Pedestrian Committee already are already teaching League-Certified classes, as described above. However, there are no payments to graduates and no payments to instructors, in the Oceanside program.</p>	<p>Biking-related measures, along with other alternative modes of transportation, will be addressed in the Active Transportation Plan, currently under development. Once the ATP is complete, it will be integrated into the CAP.</p>
Eliminate or Greatly Increase the Maximum Height and Density Limits Close to Transit Stops that Meet Appropriate Service Standards	<p>As sprawl is reduced, more compact, transit-oriented development (TOD) will need to be built. This strategy will incentivize a consideration of what level of transit service will be needed, how it can be achieved, and what levels of maximum height and density are appropriate. Having no limits at all is reasonable if models show that the development can function without harming the existing adjacent neighborhoods, given the level of transit service and other supporting transportation policies. One such supporting transportation policy would be the use of car-parking systems described in References 4 and 5, which support the full sharing of parking, less driving, and less car ownership.</p>	<p>Transit oriented development is being considered through the Housing Element Update. The CAP focuses on facilitating alternative transportation within the communities that are already built-out.</p>

Commenter: Sierra Club

Comment Subject	Comment	Response
Community Choice Energy and Other Feasible Mitigation Measures	We are pleased that you are joining with Carlsbad and other cities to the South of Oceanside to investigate the feasibility of forming a Community Choice Energy (CCE) District, under California Community Choice Aggregation (CCA) law. In the last three years, the rise of Community Choice Energy in California has been dramatic. The first Community Choice Agency (CCA), Marin Clean Energy, launched in 2010, and was the only one for four years until Sonoma Clean Power launched in 2014, followed soon after by Lancaster Choice Energy in 2015. By mid-2015 a critical mass of information-sharing and proof-of-concept had spread throughout California and by late 2016 nearly half the counties in the state and over 300 cities were either operational or at some stage of evaluation of Community Choice. The CAP should include, as a recommended mitigation measure, the formation of a Community Choice Energy (CCE) District, under California Community Choice Aggregation (CCA) law.	The CAP sets a renewable energy goal and identifies a City Action that would establish a CCE program as one means of achieving that goal.
In Closing	Thank you for your leadership in performing your critical work. Thank you for reading this material. Please let us know if you would like to meet to discuss this letter or related topics.	Comment noted.

Commenter Name	Comment Subject	Comment Summary	Response
Joan Herskowitz	Drive Thrus	*Would like to see a cap on drive-thrus included in the Plan because the idling produces unnecessary emissions	The CAP includes a comprehensive set of effective, feasible strategies to reduce VMT and fuel consumption. Separate data for idling emissions is not available at this time.
Helen Baurne	Zero Waste	Composting should be encouraged in City neighborhoods w/ community volunteers to manage operation	The City currently manages an outreach program to encourage home composting, including offering discounted compost bins and composting classes.
	Transportation: ZEV	*City should purchase/lease electric shuttles for city public transportation network as well as schools. EV shuttles address residents who cant bike or walk as their primary mode.	The City does, and will continue to coordinate with local school district(s) to determine and implement the most effective, feasible, school-related measures to reduce GHG emissions. Measures being considered include busing, carpool programs, energy efficiency upgrades, Safe Routes to School and other measures. Strategy 4 of the CAP includes developing a local shuttle system that would service community schools.
	Impervious Surfaces	*Promote water conservation, install pervious pavement where feasible, increase green space and trees. Don't limit water use for greening.	Strategy 3 of the CAP includes measures that promote water conservation, including promoting the use of Low Impact Development features like permeable pavement through the City's Clean Water Program. Strategy 7 of the CAP includes measures that promote increasing the City's urban forest.
	Urban Forest	*Plant 300-500 trees by 2020 and maintain the health of new trees	City Action CS-1 of the CAP proposes planting at least 50 trees per year which equates to 150 new net trees by 2020 and 650 new net trees by 2030. If any city trees require removal, trees will be replanted per the City policy. The CAP also proposes to right-size tree selection to minimize pruning and irrigation needs.
	Idle Free Zones	Include idle free zones in the city to eliminate wasteful emissions	The State has mandated idling restrictions for commercial trucks and buses. Federal and State Vehicle Efficiency Standards also address idling emissions. Additionally, many City Actions and measures in the CAP promote the adoption of Electric Vehicles which do not idle or generate any tailpipe emissions. These measures are expected to be more effective at reducing idling emissions than imposing idle free regulations beyond those already mandated by the state.
	Concrete	*Increase green spaces and vegetation in the city's right of ways, avoid the unnecessary use on concrete and pavement	Limiting use of impervious surfaces is a component of the City's Stormwater BMP Design Manual. Any new infrastructure, in the right of way or otherwise, is required to meet BMP Design Manual regulations.
	Affordable Housing	*Ease City's restrictions and standards to allow for REAL affordable and work force housing. Allow and plan for tiny home communities.	Increasing the amount of affordable housing is the primary goal of the Housing Element Update. Once the Housing Element is adopted, City restrictions would be modified to promote the development of more affordable housing.
	Encourage Conservation	Consider small changes; ask community to conserve energy.	The CAP includes many measures and an overarching educational component that aims to encourage individual community members to do their part to reduce emissions. When determining what measures to include in the CAP, selecting those that were reasonable and feasible for the community to implement was a primary consideration.

Public Comments on Encinitas Draft CAP - Handwritten Workshop Comments

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	Idle Free Zones	Include idle free zones in the city to eliminate wasteful emissions	The State has mandated idling restrictions for commercial trucks and buses. Federal and State Vehicle Efficiency Standards also address idling emissions. Additionally, many City Actions and measures in the CAP promote the adoption of Electric Vehicles which do not idle or generate any tailpipe emissions. These measures are expected to be more effective at reducing idling emissions than imposing idle free regulations beyond those already mandated by the state.
	Concrete	*Increase green spaces and vegetation in the city's right of ways, avoid the unnecessary use on concrete and pavement	Limiting use of impervious surfaces is a component of the City's Stormwater BMP Design Manual. Any new infrastructure, in the right of way or otherwise, is required to meet BMP Design Manual regulations.
	Affordable Housing	*Ease City's restrictions and standards to allow for REAL affordable and work force housing. Allow and plan for tiny home communities.	Increasing the amount of affordable housing is the primary goal of the Housing Element Update. Once the Housing Element is adopted, City restrictions would be modified to promote the development of more affordable housing.
	Encourage Conservation	Consider small changes; ask community to conserve energy.	The CAP includes many measures and an overarching educational component that aims to encourage individual community members to do their part to reduce emissions. When determining what measures to include in the CAP, selecting those that were reasonable and feasible for the community to implement was a primary consideration.

CAP Subcommittee Comments on Encinitas Draft CAP

CAP Subcommittee Comments	Response
Change Goal 2.1 to "Achieve 100% Renewable Electricity Supply in Homes and Businesses"	Climate Action Plan revised accordingly
City Action RE-1: Change "CCE or Similar program" to "CCE"	Climate Action Plan revised accordingly
RE-1 2030 target: Change customer participation from 80% to 90%	Goals and participation rates for measures, including the renewable energy goal, are based on what is feasible and achievable based on similar programs in the State. Customer participation has not been revised based on this comment to ensure that assumptions in the qualified CAP are substantiated.
Coordinate school busing with NCTD	Supporting measures related to busing were revised to include coordination of school busing with NCTD where possible.
Implementation Matrix should include quantitative, life-cycle costs and benefits, including consideration of co-benefits	Implementation Plan will include estimates of administrative cost and resources needed to implement the CAP. A detailed cost-benefit analysis was not scoped for this iteration of the Implementation plan and will be identified as a future action.
Include social equity in jobs in CAP	A social equity section will be added to Chapter 4 of the Climate Action Plan
CAP should include policy to locate housing near transit	Housing location will be addressed in Housing Element update. CAP focuses on improving transit access in existing communities (e.g., local shuttle and Active Transportation Plan)

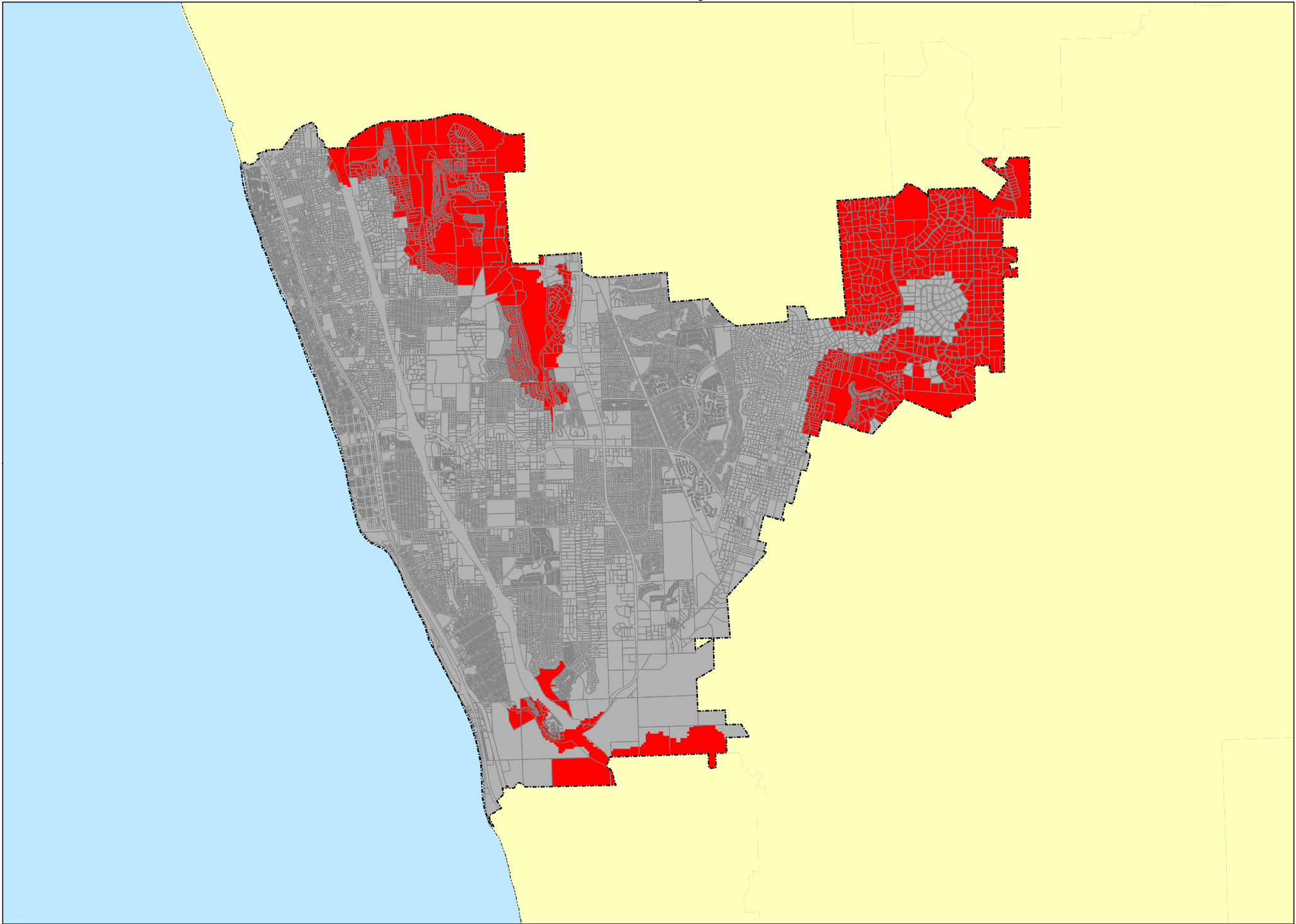
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Appendix F

Fire Hazard Severity Zone Map

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Very High Fire Hazard Severity Zones in LRA As Recommended by CAL FIRE



Fire Hazard Severity Zones

Local Responsibility Area	State or Federal Responsibility Areas
VHFHSZ	VHFHSZ
Non-VHFHSZ	Non-VHFHSZ

City Boundary
Parcels
County Boundary

Government Code 91175.59 directs the California Department of Forestry and Fire Protection (CAL FIRE) to identify areas of very high fire hazard severity zones within Local Responsibility Areas (LRA). Mapping of the areas, referred to as Very High Fire Hazard Severity Zones (VHFHSZ), is based on data and models of potential fire over a 30-50 year time horizon and their associated expected fire behavior, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure (including frequency) to buildings. Details on the project and specific modeling methodology can be found at <http://www.cdf.ca.gov/resources/landfire/mrds.htm>. Local Responsibility Area VHFHSZ maps were initially developed in the mid-1980s and are now being updated based on improved science, mapping techniques, and data.

In late 2005 to be effective in 2006, the California Building Commission adopted California Building Code Chapter 7A, requiring new buildings in VHFHSZs to use ignition resistant construction methods and materials. These new codes include provisions to improve the ignition resistance of buildings, especially from firebrands. The updated very high fire hazard severity zones will be used by building officials for new building permits in LRA. The updated zones will also be used to identify property whose owners must comply with natural hazards disclosure requirements at time of property sale and 100 foot defensible space clearance. It is likely that the fire hazard severity zones will be used for updates to the safety element of general plans.

This specific map is based on a geographic information system dataset that depicts final CAL FIRE recommendations for Very High Fire Hazard Severity Zones within the local jurisdiction. The process of finalizing these boundaries involved an extensive local review process, the details of which are available at <http://www.cdf.ca.gov/resources/landfire/mrds.htm> (click on "Continuous as guest without logging in"). Local government has 120 days to designate, by ordinance, very high fire hazard severity zones within its jurisdiction after receiving the recommendation. Local government can add additional VHFHSZs. There is no requirement for local government to report their final action to CAL FIRE when the recommended zones are adopted. Consequently, users are directed to the appropriate local entity (county, city, fire department, or Fire Protection District) to determine the status of the local fire hazard severity zone ordinance.

This map was developed using data products such as parcel and city boundaries provided by local government agencies. In certain cases, this includes copyrighted geographic information. The maps are for display purposes only - questions and requests related to parcel or city boundary data should be directed to the appropriate local government entity.

North Arrow

Scale 1: 20,000
at 36" x 36"

June 11, 2009

Projection: Albers, NAD 1983
Scale 1: 20,000
at 36" x 36"

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Appendix G

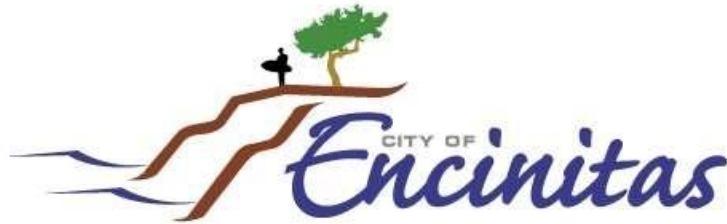
2020 Interim Climate Action Plan Update

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Climate Action Plan Update Supporting Analysis

October 2020

Prepared for
City of Encinitas



Prepared by
Energy Policy Initiatives Center
University of San Diego



About EPIC

The Energy Policy Initiatives Center (EPIC) is a non-profit research center of the USD School of Law that studies energy policy issues affecting California and the San Diego region. Energy Policy Initiatives Center's mission is to increase awareness and understanding of energy- and climate-related policy issues by conducting research and analysis to inform decision makers and educating law students.

For more information, please visit EPIC's website at www.sandiego.edu/epic.

The Energy Policy Initiatives Center (EPIC) prepared this report for the City of Encinitas. This report represents EPIC's professional judgment based on the data and information available at the time EPIC prepared this report. EPIC relies on data and information from third parties who provide it with no guarantees such as of completeness, accuracy or timeliness. EPIC makes no representations or warranties, whether expressed or implied, and assumes no legal liability for the use of the information in this report; nor does any party represent that the uses of this information will not infringe upon privately owned rights. Readers of the report are advised that EPIC may periodically update this report or data, information, findings, and opinions and that they assume all liabilities incurred by them, or third parties, as a result of their reliance on the report, data, information, findings and opinions contained in the report.

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1. INTRODUCTION

The City of Encinitas (the City) completed the Housing Element Update (HEU) in March 2019.¹ The Encinitas 2018 Climate Action Plan (2018 CAP) committed to an update within 20 months of the effective date of the HEU, to reflect the impact of anticipated housing units on greenhouse gas (GHG) emissions.

Section 2 of this report discusses the changes to the CAP target year 2030 business-as-usual (BAU) GHG emissions projection due to the HEU, as well as from the latest updates on emission-generating activities and emission models since adoption of the 2018 CAP. The BAU projection demonstrates emissions growth in the absence of any new policies and programs and does not consider future impacts of currently adopted federal and State policies.

Section 3 discusses the legislatively-adjusted BAU projection, which includes GHG impacts of federal and State regulations. The 2018 CAP's legislatively-adjusted BAU projection included the GHG impacts of the federal and State legislative actions only through mid 2017. This 2018 CAP Update includes the impact of legislative actions through June 2020.

Section 4 discusses the updates and revisions to existing CAP measures and the inclusion of a new CAP measure.

In this report, the "City Actions (Actions)" identified in the 2018 CAP GHG reduction strategy framework are renamed "CAP Measures."² However, the meaning has not changed. "CAP Measures" are defined as "programs, policies, or projects the City will implement that will cause a direct and measurable reduction in greenhouse gas emissions". This modification is made to be consistent the language used in the Regional Climate Action Planning Framework (ReCAP) developed by SANDAG in 2018, after the Encinitas CAP was adopted.³

2. UPDATED BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS PROJECTION

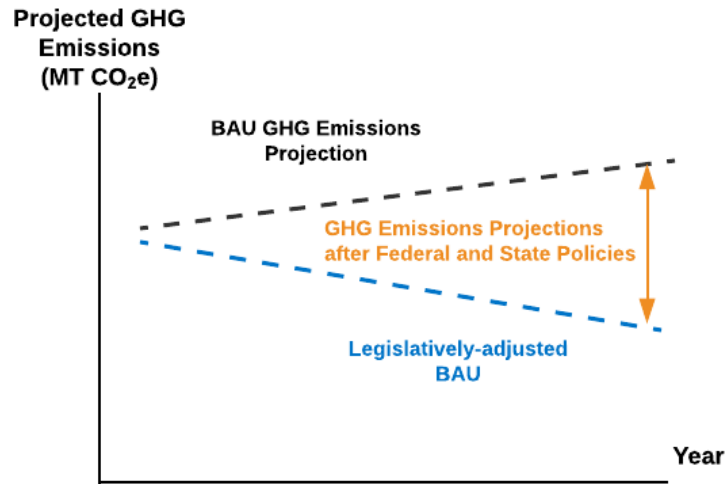
To inform the development of GHG mitigation strategies within a CAP, GHG emissions are projected using the latest emission-generating activity data, as well as estimates for population, housing, and job growth. The latest year with available activity data may be different for different inventory categories. This projection is known as the Business-As-Usual (BAU) projection.

The legislatively-adjusted BAU projection is a BAU projection that is adjusted to include future GHG reduction effects of currently adopted regulatory policies and programs. Figure 1 provides an illustrative example of the difference between a BAU projection and a legislatively-adjusted BAU projection. Only the BAU projection is discussed in this section. The legislatively-adjusted BAU is discussed in Section 3.

¹ Encinitas [Housing Plan Update 2019](#).

² Encinitas [2018 Climate Action Plan](#). Section 3.1 GHG Reduction Strategy Framework.

³ SANDAG [Regional Climate Action Planning Framework \(ReCAP\)](#). ReCAP establishes a technical framework for regionally consistent climate action planning that preserves local policy flexibility for the unique needs and circumstances of each local jurisdiction.



Energy Policy Initiatives Center, 2018

Figure 1. Illustrative Example Only: BAU and Legislatively-adjusted BAU Emissions Projections

2.1 COMPARISON OF PROJECTED 2030 EMISSIONS IN THE 2018 CAP AND PROJECTED EMISSIONS IN THIS 2018 CAP UPDATE

The focus of the report is to estimate the impact of updated projections and measure revisions on the 2030 target. The report does not include the estimated impact on the 2020 target because the City's latest 2016 GHG inventory shows the citywide GHG emissions at 380,600 MT CO₂e, below the 2020 CAP target of 421,481 MT CO₂e.⁴

Table 1 provides a comparison of the 2030 emissions projected in the 2018 Encinitas CAP and in this 2018 CAP Update.⁵

Table 1. Comparison of Projected Emissions in the 2018 Encinitas CAP and CAP Update

GHG Emissions Category	Projected 2030 Emissions in Encinitas 2018 CAP*	Projected 2030 Emissions in Encinitas 2018 CAP Update
On-Road Transportation	221,787	200,051
Electricity	129,680	88,193
Natural Gas	77,062	64,702
Solid Waste	25,014	15,819
Off-Road Transportation	11,441	11,941
Water	15,541	4,409
Wastewater	2,625	1,227
Total	483,150	386,341
*Encinitas 2018 CAP Table 2-2		

⁴ Encinitas [Climate Action Plan Annual Report 2019](#) (January 2020). Figure 2.

⁵ Encinitas [2018 Climate Action Plan](#).

The method to project GHG emission is the same in both cases. However, the results differ due to certain contributing factors (e.g., different from previously projected activity data). The main reasons for the changes are discussed below by each emission category.

2.2 COMPARISON OF EMISSIONS BY CATEGORY

SANDAG Series 13 Regional Growth Forecast was used as the basis of population and job growth in the 2018 Encinitas CAP.⁶ For consistency, the impacts of the HEU were modeled by SANDAG for the City of Encinitas using the Series 13 Regional Growth Forecast model for this 2018 CAP Update. SANDAG model results showed that because of the HEU and associated increased housing, the projected 2030 population increases by 6% compared with the previous projection but the 2030 employment decreases by 3% compared with the previous projection.⁷ A comparison of the 2030 population and employment estimates is provided in Table 2.

Table 2. Comparison of Demographic Forecast in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Population	64,938	68,345
Employment	27,958	27,240
*Encinitas 2018 CAP SANDAG Series 13 Growth Forecast is the basis of both versions of population and employment forecast. The forecast included in the 2018 CAP Update incorporated the additional impact of the Encinitas Housing Element Update. SANDAG, 2015 and 2020.		

2.2.1 On-Road Transportation

The 2030 BAU vehicle-miles traveled (VMT) projections including the HEU are also based on the Series 13 Regional Growth Forecast modeled by SANDAG for Encinitas. While the VMT projected for 2030 are minimally higher than in the previous projection, the GHG emissions from on-road transportation are now 10% lower than previously projected in the 2018 CAP. A comparison of VMT, average vehicle emission rates, and corresponding GHG emissions from the on-road transportation category are given in Table 3.

Table 3. Comparison of Emissions from On-road Transportation in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Vehicle miles traveled (Average weekday miles)	1,557,207	1,588,756
Average vehicle emission rate ((g CO ₂ e/mile)	407	363
Projected 2030 GHG Emissions (MT CO ₂ e)	221,787	200,051
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

⁶ Encinitas [2018 Climate Action Plan](#). Appendix A.

⁷ The population increased because the housing units increased in the HEU. Agricultural areas were removed and replaced with housing and some of the additional units are now planned on previously non-vacant non-residential sites, which could be reasons for the decrease in employment.

The change in on-road transportation emissions is mostly for the following reasons:

- **11% decrease in 2030 vehicle GHG emissions rate.** The vehicle tailpipe emission rates are obtained from the state emission factor model for each subregion in the state. The most recent updated vehicle emission factor model, Emission FACTor 2017 (EMFAC2017), was released after the 2018 CAP adoption. This model incorporates historical data (up to year 2016) on vehicle distribution by fuel type, updated vehicle emission testing results, and effects of the latest regulations that reduce GHG emissions. As such, EMFAC2017 emissions results provide the latest available fleet characteristics, reflecting improved fleet efficiencies and more electric vehicles.
- **2% increase in VMT due to the HEU.** SANDAG developed a customized travel demand model run based on its Series 13 network for the City to incorporate the impact of HEU. The 2030 VMT from this model run is only 2% higher than previously projected VMT from Series 13. The modeled 6% increase in projected population is not proportional to the modeled increase in VMT which is also affected by the employment rate. Shorter commute and non-commute trips may have impacted the VMT projection.

2.2.2 Electricity

The 2030 emissions from electricity are 32% now lower than previously projected in the 2018 CAP. A comparison of the projected electricity use (net energy for load), city-specific electricity emission factor, and corresponding GHG emissions from the electricity category is given in Table 4.

Table 4. Comparison of Year 2030 Emissions from Electricity in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected net energy for load (electricity sales + losses) (MWh)	382,826	341,116
City-specific electricity emission factor (lbs CO ₂ e/MWh)	747	570
Projected 2030 GHG emissions (MT CO ₂ e)	129,680	88,193
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

The change in emissions from electricity is mostly for the following reasons:

- **Reduced net energy for load: lower than previously projected per capita and higher than previously projected per job electricity use.** Using the latest 2018 electricity use data, the per capita electricity use in the 2018 CAP Update projection is 20% less than in the 2018 CAP projection. The per job electricity use in the 2018 CAP Update projection is 14% greater than in the 2018 CAP projection. The 2018 electricity data is used for projection in 2018 CAP Update because it represents the latest available information.
- **Higher than previously projected renewable content in electricity.** The renewable content in SDG&E's 2018 electricity portfolio was 44% renewable, higher than the 19% renewable in 2012 used for projection in the 2018 CAP. The 2030 projected renewable content was the same as 2012 in the 2018 CAP. The 2030 projected renewable content in this 2018 CAP Update is the same as in 2018 (44%). Therefore, the electricity emission factor is now 24% lower than previously projected. The higher the renewable content, the lower the GHG emissions from electricity use.

- **Lower per capita and higher per job electricity use.** Because of the HEU, the projected 2030 population increased by 6% and employment decreased by 3%. The 2030 electricity uses from residential and non-residential customer classes are projected based on population and employment growth, respectively, therefore the electricity use changed accordingly.

2.2.3 Natural Gas

The 2030 emissions from natural gas are now 16% lower than previously projected in the 2018 CAP. A comparison of the projected natural gas use, natural gas emission factor, and corresponding GHG emissions from the natural gas category is given in Table 5.

Table 5 Comparison of Emissions from Natural Gas in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected natural gas use (Million therms)	14.1	11.9
Natural gas emission factor (MT CO ₂ e/therm)	0.00545	0.00545
Projected 2030 GHG emissions (MT CO ₂ e)	77,062	64,702
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

The reasons for the change are similar to those provided above for the electricity emissions, that is: changes in population and employment projections, and lower than previously projected per capita (19% decrease) and higher than previously projected per job (21% increase) natural gas use. However, the natural gas emission factor is the same in both projections.

2.2.4 Solid Waste

The 2030 emissions from solid waste are now 37% lower than previously projected in the 2018 CAP. A comparison of the projected waste disposal, mixed-waste emission factor, and corresponding GHG emissions from the solid waste category is given in Table 6.

Table 6. Comparison of Emissions from Solid Waste in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected solid waste disposal (Metric tons)	64,297	65,063
Mixed waste emission factor (MT CO ₂ e/wet short ton)	1.5	0.98
Projected 2030 GHG emissions (MT CO ₂ e)	25,014	15,819
Landfill gas capture rate and oxidation rate are applied to calculate the emissions. *Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

The change in emissions projection due to solid waste is mostly for the following reasons:

- **Higher than previously projected waste disposal due to the HEU.** As indicated above, the 2030 population is 6% higher than previously projected. Because waste disposal is projected in proportion to population, the waste disposal is higher than previously projected.
- **Lower than previously projected mixed waste emission rate.** A 2016 City of Oceanside waste characterization study was used as a proxy to calculate the mixed waste emission rate for Encinitas. Previously, in the 2018 CAP, a default mixed waste emission factor from ICLEI U.S. Community Protocol was used. The updated mixed waste emission factor is likely more representative for Encinitas than a default factor and represents the most recent data source.

This change will also affect CAP measure ZW-1, which aims to increase waste diversion from landfills, because the emission rate from waste is lower than previously projected, the emissions avoided amount waste diversion will be lower as well.

2.2.5 Off-Road Transportation

The 2030 emissions projection from off-road transportation is now 4% higher than previously projected, because of the changes in population and employment projections due to the HEU. The emissions from off-road sub-categories, lawn and garden equipment and pleasure craft, are based on a per capita value and the new population forecast; and the emissions from light commercial equipment is based on a baseline per capita value and the new employment projection. Changes in population and employment projections are reflected accordingly in these sub-categories. A comparison of the projected GHG emissions from the off-road transportation category is given in Table 7.

Table 7. Comparison of Emissions from Off-Road Transportation in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected 2030 GHG emissions (MT CO ₂ e)	11,441	11,941
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

2.2.6 Water

The 2030 emissions from water are now 70% lower than previously projected in the 2018 CAP. A comparison of the projected water use and corresponding GHG emissions from the water category is given in Table 8.

Table 8. Comparison of Emissions from Water in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected water use (potable + recycled) (Acre-feet)	13,945	12,943
Projected 2030 GHG emissions (MT CO ₂ e)	15,541	4,409
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

The change in emissions from water is mostly for the following reason:

- **Lower than previously projected water energy intensity data.** In this 2018 CAP Update, the water supplied to Encinitas from each source (imported water and local supply) and the electricity used to supply, treat, and deliver water were collected from each water district, San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD). The metered water and energy use data are specific to Encinitas water users in each water district's service area. Previously, data from a statewide water-energy study was the best available data source. A comparison of the water-energy intensities is given in Table 9.

Table 9. Comparison of Emissions from Water-Energy Intensities in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update**
Upstream Supply and Conveyance (kWh/Acre-foot)	3,170	1,816 (imported treated water) 1,755 (imported raw water)
Water Treatment (kWh/Acre-foot)	223	44 (SDWD) 128 (OMWD)
Water Distribution (kWh/Acre-foot)	95	6 (SDWD) 64 (OMWD)
SDWD: San Dieguito Water District, OMWD: Olivenhain Municipal Water District *Encinitas 2018 CAP **Imported treated and raw water energy intensities were based on San Diego County Water Authority's 2015 Urban Water Management Plan. 2018 data SDWD and OMWD energy intensities were provided by water districts for their entire services areas. SDWD's water service area is within Encinitas; however, OMWD's water service area is larger than Encinitas. Energy Policy Initiatives Center 2020.		

This data source is more recent, accurate and city-specific and results in a significant decrease in water-energy intensity and electricity used to supply water compared with the data from the previous state water study. The much lower electricity use results in much lower GHG emissions compared with the 2018 CAP projection.

Because GHG emissions from water use represent only 1% of the total projected 2030 emissions, this large change does not impact the total emissions significantly. This change will also affect CAP measure WE-1, which aims to reduce electricity use for water treatment and delivery and the associated emissions, because the energy intensities are lower than previously projected and the emissions reduction will be lower as well.

2.2.7 Wastewater

The 2030 emissions from wastewater are 50% lower than previously projected in the 2018 CAP. A comparison of the projected water use and corresponding GHG emissions from the water category is given in Table 10.

Table 10. Comparison of Emissions from Wastewater in the 2018 Encinitas CAP and CAP Update

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected wastewater generation (Million gallons)	1,916	895
Wastewater emission factor (MT CO ₂ e/million gallon)	1.37	1.37
Projected 2030 GHG emissions (MT CO ₂ e)	2,625	1,227
*Encinitas 2018 CAP Energy Policy Initiatives Center 2020.		

The change is mostly due to the lower than previously projected wastewater generation. In this 2018 CAP Update, the wastewater generated in Encinitas is estimated based on the 2018 flows collected by three wastewater districts, in total 809 million gallons, and projected to be 895 million gallons in 2030 based on population growth. Previously, the flow data provided for the 2018 CAP calculation was 1,573 million gallons in 2012 (72 gallons per person per day), significantly higher than in 2018, and projected to be 1,916 million gallons in 2030 based on population growth. The 2018 flow data (809 million gallons, 36 gallons per capita per day) were used to project flow in 2030.

Because emissions from wastewater represent less than 1% of the total projected 2030 Encinitas emissions, this change does not impact the total emissions significantly.

3. UPDATED LEGISLATIVELY-ADJUSTED BUSINESS-AS-USUAL PROJECTION

The legislatively-adjusted BAU projection includes GHG impacts of federal and State regulations. The 2018 CAP's legislatively-adjusted BAU projection included the GHG impacts of the following federal and State legislative actions through mid 2017:⁸

- California Renewables Portfolio Standard
- California Solar Policies and Programs
- California Energy Efficiency Standards
- Federal and California Vehicle Efficiency Standards

New regulations have been adopted since the 2018 CAP. Methods to estimate the impacts of existing legislative actions have also been updated to incorporate the latest information and the implementation progress of the actions. Therefore this 2018 CAP Update includes the latest information as of June 2020.

Table 11 provides a comparison of the 2030 legislatively-adjusted BAU in the 2018 Encinitas CAP and in this 2018 CAP Update.⁹

Table 11. Comparison of Legislatively-adjusted BAU Projections in the 2018 Encinitas CAP and CAP Update

GHG Emissions Category	Projected 2030 Emissions in Encinitas 2018 CAP*	Projected 2030 Emissions in Encinitas 2018 CAP Update
On-Road Transportation	165,001	171,343
Electricity	119,587	29,988

⁸ Encinitas [2018 Climate Action Plan](#). Section 2.3.2 Legislative Reductions.

⁹ Encinitas [2018 Climate Action Plan](#). Table 2-2.

GHG Emissions Category	Projected 2030 Emissions in Encinitas 2018 CAP*	Projected 2030 Emissions in Encinitas 2018 CAP Update
Natural Gas		57,574
Solid Waste	25,014	15,819
Off-Road Transportation	11,441	11,941
Water	15,541	4,409
Wastewater	2,625	1,227
Total	338,209	292,300
*Encinitas 2018 CAP Table 2-2, emissions from electricity and natural gas is combined as an energy sector		

The updates are separated into two sections: updates to legislative actions included in the 2018 CAP (Section 3.1) and new actions since the 2018 CAP adoption (Section 3.2). Section 3.3 provided a summary of the GHG avoided from revised and new actions.

3.1 UPDATES TO LEGISLATIVE ACTIONS INCLUDED IN THE 2018 CAP

3.1.1 Federal and California Vehicle Standards

Federal and California vehicle economy standards are incorporated into vehicle emissions models to estimate all types of vehicle emissions. Emission FACTor model (EMFAC) is the California vehicle emission model. The 2018 CAP relied on the EMFAC2014 version to calculate the per mile GHG emission factor from vehicles. The most recent vehicle emission factor model, EMFAC2017, was released after the 2018 CAP adoption. EMFAC2017 incorporates historical data up to year 2016 on vehicle attribution and technologies, updated vehicle emission testing results, and effects of the latest regulations that reduce GHG emissions. As such, EMFAC2017 emissions results provide the latest available fleet characteristics, reflecting improved fleet efficiencies and more electric vehicles. Average vehicle emission rates from EMFAC2017 were used to estimate emissions from on-road transportation in the 2018 CAP Update.

EPIC made additional adjustments to EMFAC2017 outputs. This was needed because the federal Safe Affordable Fuel-Efficiency (SAFE) Vehicle Rule, produced by the U.S. Environmental Protection Agency (U.S.EPA) and National Highway Traffic Administration (NHTSA) and released in April 2020, relaxed the GHG tailpipe emissions and the Corporate Average Fuel Economy (CAFE) standards for model year 2021–2026 vehicles and denied California the ability to have more stringent standards.¹⁰ Therefore, California Air Resources Board (CARB) released off-model adjustment factors that could be used to adjust tailpipe CO₂ emissions outputs from EMFAC models to account for the impacts of SAFE Rule.¹¹ The adjustment factors for the EMFAC2017 model were used here to adjust average vehicle emission rates and emissions from on-road transportation.

¹⁰ U.S.EPA and NHTSA: [Safer Affordable Fuel-Efficient \(SAFE\) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks](#). April 30, 2020.

¹¹ CARB: [EMFAC Off-Model Adjustment Factors for Carbon Dioxide \(CO₂\) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule](#). June 26, 2020.

A comparison of the average vehicle emission rates used in the 2018 CAP and 2018 CAP Update is shown in Figure 2 below. Due to this adjustment, the projected vehicle emission rate in 2030 increases by 2% from 297 g CO₂e/mile to 304 g CO₂e/mile.

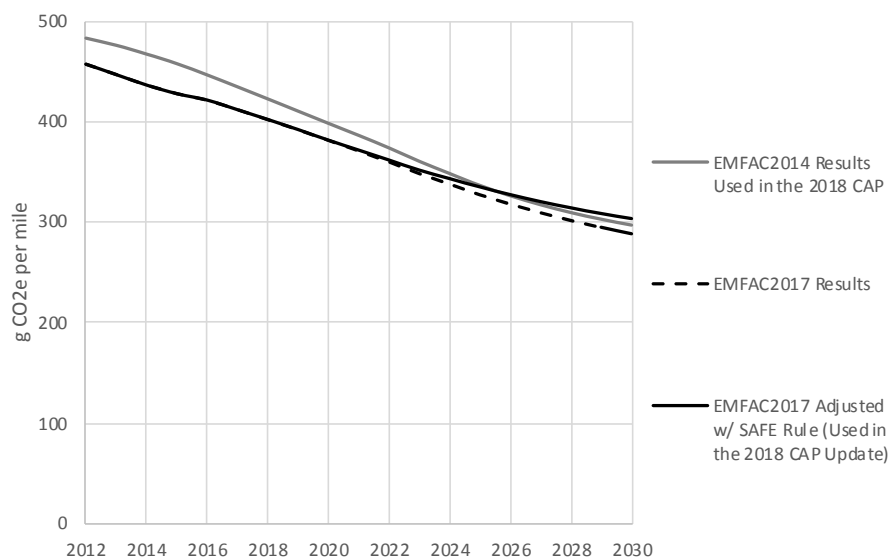
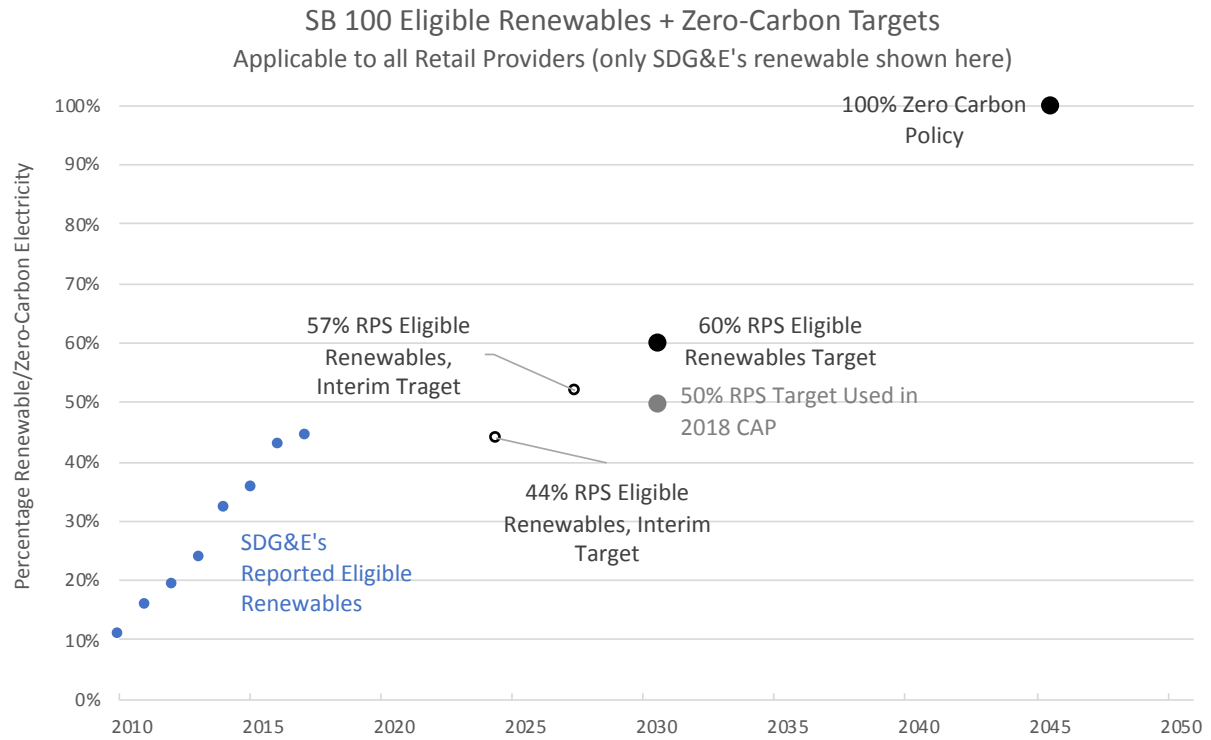


Figure 2. Comparison of the Projected Vehicle Emission Rates Used in 2018 CAP and 2018 CAP Update

3.1.2 Renewables Portfolio Standard (RPS)

SB 100, the 100 Percent Clean Energy Act of 2018, adopted a 60% RPS for all of California’s retail electricity suppliers by 2030. This increases the current RPS standard from 50%. The legislation also provides goals for the intervening years before 2030 and establishes a State policy requiring that “zero-carbon” resources supply 100% of all retail electricity sales to end-user customers and all State agencies by December 31, 2045.¹² Therefore, the 2030 RPS target has been updated to 60% renewables in the 2018 CAP Update, from 50% renewables in the 2018 CAP. A comparison of the RPS targets used in 2018 CAP and 2018 CAP Updates is shown in Figure 3.

¹² SB 100 (de León): [California Renewables Portfolio Standard Program: emissions of greenhouse gases](#) (2017–2018). The interim RPS targets are 44% by 2024 and 52% by 2027 from eligible renewable energy resources.



Targets apply to all retail providers include electric service providers for Direct Access, Community Choice Aggregators and Investor Owned Utilities.
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Figure 3. Comparison of the RPS Targets in 2018 CAP and 2018 CAP Update

3.1.3 California Solar Initiative, New Solar Homes Partnership, Net Energy Metering

California has several policies and programs to encourage customer-owned, behind-the-meter PV systems, including the California Solar Initiatives, New Solar Home Partnership, net energy metering, and electricity rate structures designed for solar customers. The PV capacity in Encinitas was projected using the PV capacity in California Energy Commissions (CEC) energy demand forecast for SDG&E's planning area, and the average ratio of historical PV generation in Encinitas to that of SDG&E's planning area. The CEC energy demand forecast is revised and published annually; and the historical PV generation is reported quarterly. Several updates have been made since the adoption of the 2018 CAP. Table 12 below shows the differences in the data and data sources used in the 2018 CAP and this 2018 CAP Update.

Table 12. Data and Data Sources Differences in the 2018 CAP and 2018 CAP Update (PV Projection)

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Interconnected PV system data historical years	2012–2015	2012–2018
Average ratio of PV capacity in Encinitas to PV capacity in SDG&E service area	2.2% (average of 2012–2015)	2.3% (average of 2012–2018)
Version of CEC Energy Demand Forecast	2017–2027 Energy Demand Forecast (Published in 2016)	2020–2030 Energy Demand Forecast (Published in 2020)

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Projected 2030 electricity generation from PV in the SDG&E planning area	3,335 GWh	4,355 GWh
Projected 2030 electricity generation from PV in Encinitas**	70.9 GWh	98.7 GWh
Projected 2030 PV capacity in Encinitas**	40.5 MW	56.3 MW
*Encinitas 2018 CAP **Electricity generation and capacities do not include the impact of Encinitas CAP measures. Energy Policy Initiatives Center 2020.		

The projected 2030 electricity generation from PV in the SDG&E planning area in the latest CEC energy demand forecast is approximately 40% higher than in the energy demand forecast used in the 2018 CAP. This update led to a 40% increase in the 2030 projected PV capacity in Encinitas. The latest energy demand forecast includes the latest market trend and the impact of the 2019 PV mandate on new single-family homes, which was adopted after the 2018 CAP. The 2019 PV mandate is discussed in detail in Section 3.2. A comparison of the PV capacity used in the 2018 CAP and 2018 CAP Update is shown in Figure 4 below.

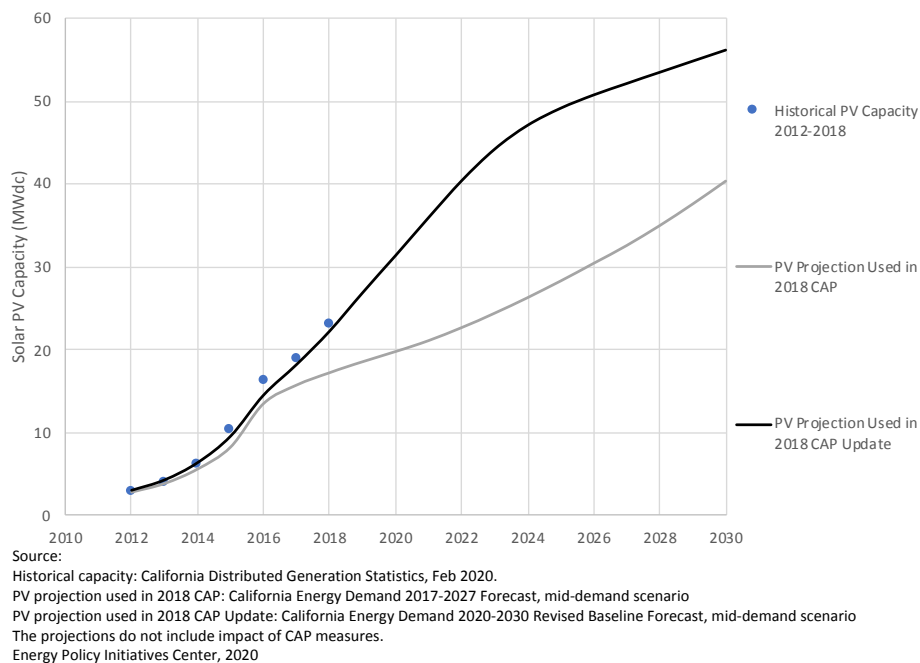


Figure 4. Comparison of the PV Capacity Projection Used in 2018 CAP and 2018 CAP Update

3.1.4 California Energy Efficiency Programs through 2030

In September 2017, the California Public Utilities Commission (CPUC) adopted energy efficiency goals for ratepayer-funded energy efficiency programs (Decision 17-09-025); these went into effect in 2018. The adopted energy saving goals for SDG&E's service territory are given in the Decision on an annual basis from 2018 to 2030.¹³ The sources of the energy savings include, but are not limited to, rebated

¹³ CPUC: [Decision 17-09-025, Adopting Energy Efficiency Goals for 2018–2030](#), accessed December 12, 2018. SDG&E's electricity service territory is larger than San Diego region.

technologies, building retrofits, behavior-based initiatives, and codes and standards.¹⁴ The energy efficiency goal study is revised and published annually. In the 2018 CAP, the 2015 study from CPUC Decision 14-10-046 was used. Several updates have been made since the adoption of the 2018 CAP. Table 13 below shows the differences in the data and data sources used in the 2018 CAP and this 2018 CAP Update.

Table 13. Data and Data Sources Differences in the 2018 CAP and 2018 CAP Update (Utility Energy Efficiency Program Savings)

Data Categories	Encinitas 2018 CAP*	Encinitas 2018 CAP Update
Version of CPUC Adopted Energy Efficiency Goal Study	2015 Study (Decision 14-10-046)	2018 Study (Decision 17-09-025)
2030 cumulative electricity savings in SDG&E area (GWh)	3,634 (cumulative from 2012)	3,349 (cumulative from 2018)
Average ratio of net energy for load in Encinitas to SDG&E area	1.4% (average of 2012–2014)	1.5% (average of 2016–2018)
2030 cumulative electricity savings in Encinitas (GWh)	55 (cumulative from 2012)	51 (cumulative from 2018)
2030 cumulative natural gas savings in SDG&E area (million therms)	56 (cumulative from 2012)	56 (cumulative from 2018)
Average ratio of natural gas use in Encinitas to SDG&E area	3.1% (average of 2012–2014)	2.3% (average of 2016–2018)
2030 cumulative natural gas Savings in Encinitas (million therms)	1.7 (cumulative from 2012)	1.3 (cumulative from 2018)
*Encinitas 2018 CAP **Electricity and natural gas savings do not include the impact of Encinitas CAP measures. Energy Policy Initiatives Center 2020.		

The projected 2030 energy savings used in 2018 CAP Update are cumulative savings from 2018, because 2018 is a historical year with metered energy use data. Using the latest CPUC study and ratio of energy use in Encinitas to SDG&E area, 2030 electricity savings from utility programs are 8% lower than previously projected; and 2030 natural gas savings from utility program are 23% below previously projected. This could be partially due to energy savings realized since the 2018 CAP adoption and included in the energy forecast, or that savings from codes and standards or incentives programs may be lower than expected.

3.2 NEW LEGISLATIVE ACTION SINCE THE 2018 CAP

3.2.1 2019 Building Energy Efficiency Standards and Solar Mandates for Low-rise Residential

The new California 2019 Building Energy Efficiency Standards, which went into effect on January 1, 2020, require all newly constructed single-family homes, low-rise multi-family homes, and detached accessory dwelling units (ADUs) to have PV systems installed, unless the building receives an exception.¹⁵ The 2019 Building Energy Efficiency Standard was developed and adopted after the 2018 CAP.

¹⁴ Navigant Consulting: [Energy Efficiency Potential and Goals Study for 2018 and Beyond](#) (August 2017), accessed December 12, 2018. Rebated technologies are the energy efficiency technologies from the utility's historic incentive programs, including equipment and retrofits.

¹⁵ CEC: [2019 Building Energy Efficiency Standards – 2019 Residential Compliance Manual](#) (December 2018). For the requirements on newly constructed single-family and low-rise multi-family homes, see Section 7.2 Prescriptive

The impact of the 2019 Standard on newly constructed *single-family homes* was already included in the latest PV capacity projection as discussed in Section 3.1 above. The impact of the 2019 Standard on newly constructed *low-rise multi-family homes* are discussed here.

The minimum PV system size requirement for low-rise multi-family homes is calculated based on Encinitas' Climate Zone and average unit size of the housing type, as shown in Table 14.¹⁶

Table 14. Estimated PV Requirement for New Multi-Family Homes after 2020 in Encinitas

Housing Unit Type	Average Size of Unit (sq. ft.)*	Minimum PV Required for the Unit Size (kWdc)**
Multi-family	870	1.7
* Based on the prototype home. ** Calculated based on unit size (sq. ft.) and 2019 Building Energy Efficiency Standards Residential Compliance Manual Equation 7-1 and Table 7-1. Encinitas is in Climate Zone 7. Energy Policy Initiatives Center 2020.		

The number of new multi-family homes from 2020 to 2030 is estimated based on San Diego Association of Governments (SANDAG) Series 13 Forecast and the additional units from the 2019 Encinitas Housing Element Update. All low-rise multi-family homes are subject to the mandate; however, it is assumed that 20% of the new homes would be exempt for other reasons (similar to the assumptions used in the CEC energy demand forecast), and 95% of new multi-family home would be low-rise (to account for exemptions). The numbers of new multi-family homes with PV systems as a result of the PV mandate, as well as the estimated capacity in 2030, are given in Table 15.

Table 15. Additional PV Capacity Added due to 2019 Building Energy Efficiency Standards PV mandates

Year	New Multi-family Homes after 2020 with PV Systems due to State Mandates	
	Number of Homes with PV Systems	PV System Capacity (MW)
2030	1,346	2.3
PV system capacities are the additional capacities in 2030 from all systems added to new low-rise multi-family homes after 2020 as a result of State PV mandates. The capacities do not include existing PV, PV installation at new single-family homes, or PV added to other new non-residential projects. Energy Policy Initiatives Center 2020.		

CAP Measure RE-2, which would have required all new single-family and multi-family homes starting in 2018 to install PV systems, will no longer be considered a local action because of the 2019 California PV mandate. The impact of the 2019 California PV mandate on single-family homes is now embedded in the PV forecast, so a direct comparison with Measure RE-2 cannot be made. For multi-family homes, the

Requirements for Photovoltaic System. For the requirements on newly constructed and detached ADU, see Section 9.3.5 Accessory Dwelling Units (ADUs).

¹⁶ Average unit size based on 2019 Building Energy Efficiency Standard Computer Compliance Program (CBECC-Res 2019.1.0) prototype homes.

projected 2030 PV capacity due to the 2019 PV mandate is higher than the projected capacity due to Measure RE-2 for two reasons. First, the multi-family PV system size requirement is assumed to be a minimum of 1 kW per unit in Measure RE-2, smaller than the requirement in the 2019 PV Mandate. In addition, the number of new multi-family homes assumed in the 2018 CAP Update includes the units from the Housing Element Update, which significantly increases the total number of multi-family units. As a result, the projected PV capacity in 2030, 2.3 MW, is more than double the total capacity assumed in Measure RE-2 of 1 MW.

3.3 EFFECT OF LEGISLATIVE ACTIONS ON ENCINITAS EMISSIONS AND TARGETS

The 2030 CAP target is to reduce emissions to 41% below the 2012 baseline year level, or reduce to 285,426 MT CO₂e. The impact of the legislative actions discussed in Section 2 is shown in Table 16.

Table 16. Additional PV Capacity Added due to 2019 Building Energy Efficiency Standards

Legislative Actions	2030 GHG Avoided in 2018 CAP Update* (MT CO₂e)
Federal and California Vehicle Efficiency Standards	28,708
California Energy Efficiency Programs	8,203
Renewables Portfolio Standard	35,441
California Solar Policy, Programs and 2019 Mandates	21,689
*Preliminary results.	

With all the revised and new legislative actions the 2030 emissions level is projected at 292,300 MT CO₂e. The local emissions gap to reach the 2030 target is approximately 7,300 MT CO₂e.

4. REVISIONS TO ENCINITAS CAP MEASURES

This section describes updates and revisions to 2018 CAP measures and the inclusion of new CAP measures. Updates to the CAP measures are needed for various reasons including:

- Measures are not cost-effective
- Improved or more effective measures identified
- New methods and data sources for calculating GHG emissions avoided
- New federal or State regulations that modified calculation for GHG emissions avoided

Table 17 below shows a comparison of GHG avoided from revised CAP measures and the GHG avoided as indicated in the 2018 CAP. The revised or new assumptions for each revised CAP measure and its data inputs are provided in the table.

Table 17. CAP Measures Revisions and GHG Avoided in the 2018 CAP Update

CAP Measures	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)	2030 GHG Avoided in the 2018 CAP (MT CO ₂ e)
<p>BE-1: Require energy audits of existing residential units</p> <p>Measure Revision: Adopt a residential energy efficiency ordinance</p> <ul style="list-style-type: none"> • <u>Ordinance requirement:</u> All residential property owners conducting a major renovation with a permit valued at \$50,000 or greater must comply with the ordinance to implement energy efficiency activities. <p>Energy efficiency activities required are the same as the activities listed in the 2019 Carlsbad Residential Energy Conservation Ordinance. The specific retrofit activity required depend on the age of the home.</p> <ul style="list-style-type: none"> • <u>Performance Metric:</u> <ul style="list-style-type: none"> ○ Retrofit 250 homes by 2030. 	14	122
<p>BE-2: Require new single-family homes to install solar water heaters</p> <p>The GHG avoided is given as a range. The lower bound (466 MT CO₂e avoided) is calculated based on the following measure revision:</p> <p>Measure Revision: Require electrification of new residential developments</p> <ul style="list-style-type: none"> • <u>Requirement:</u> All new low-rise residential projects (single-family and multi-family) to install heat pump water heater, or other form of electric water heating system, that meets California Energy Code (Title 24, Part 6) standards and is paired with a ≥0.3KW (300W) photovoltaic system Or Solar water heating system that is OG-300 certified and includes ≥40 sq. ft. of collectors or provides a 0.6 solar fraction. • <u>Performance Metric:</u> 	466–878	1,241

CAP Measures	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)	2030 GHG Avoided in the 2018 CAP (MT CO ₂ e)
<ul style="list-style-type: none"> Complete 1,200 new low-rise residential electrification by 2030. <p>The measure revision is because the 2018 CAP measure is found not cost-effective. The requirement is similar to Carlsbad Residential Water Heating Ordinance.</p> <p>The upper bound (878 MT CO₂e avoided) is calculated based on <i>Option 1: Single Family and Low-Rise Multi- All-electric Reach Code</i> described in Appendix B.</p>		
<p>BE-3: Adopt higher energy efficiency standards for commercial buildings (new and major renovations)</p> <p>Measure Revision:</p> <ul style="list-style-type: none"> Measure assumptions now match with current draft ordinance 2020-04 Performance Metric <ul style="list-style-type: none"> Reduce 1.4 million kWh electricity use and 5,000 therms natural gas use by 2030. 	57	200
<p>BE-4: Require commercial buildings to install solar water heaters</p> <p>Measure revision regarding new development requirement portion: Require electrification of new commercial buildings</p> <ul style="list-style-type: none"> Requirement: All new commercial projects to install heat pump water heater(s), tankless electric resistance, or other form of electric water heating system(s) that meet Title 24 standards Or Solar water heating system that provides a 0.4 solar fraction and uses OG-100 certified collectors Performance Metric: Complete 1 million square feet of commercial building electrification by 2030. <p>The measure revision is because the 2018 CAP measure is found not cost-effective. The requirement is similar to Carlsbad's Nonresidential Photovoltaic & Water Heating Ordinances. No range similar to BE-2 is given because any further commercial building electrification impact needs to be evaluated with BE-3.</p> <p>Measure revision regarding existing building requirement portion: The existing building portion of this measure is not included because currently the requirement is not cost-effective and no building electrification ordinance with similar requirement has been adopted in the State.</p>	97	2,728
<p>MBE-1: Implement energy efficiency projects in municipal facilities</p> <p>Measure Revision: None</p>	40	44

CAP Measures	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)	2030 GHG Avoided in the 2018 CAP (MT CO ₂ e)
GHG Avoided Calculation Update: Updated with revised electricity emission factor		
RE-1: Establish a Community Choice Energy or similar program Measure Revision: None GHG Avoided Calculation Update: <ul style="list-style-type: none"> The Community Choice Energy program start year is updated to 2021, with 55% GHG free electricity offering and 95% participation rates in both residential and commercial sector (SDCP implementation plan), the change in GHG avoided is due to the following reasons: <ul style="list-style-type: none"> 2030 electricity use is lower than previously projected State RPS target has increased to 60% in 2030 from 50%, resulting in less emissions avoided attributed to local action. 	19,465	43,644
RE-2: Require new homes to install solar photovoltaic (PV) systems Measure Revision: <ul style="list-style-type: none"> Remove measure since PV at single-family and low-rise multi-family is now mandated by the State, therefore, included in the legislatively-adjusted BAU projection. 	N/A: Quantified as part of legislatively-adjusted BAU projection	614
RE-3: Require commercial buildings to install solar photovoltaic (PV) systems Measure Revision: <ul style="list-style-type: none"> Measure goal and assumptions now match current draft ordinance 2020-04 	989	452
MRE-1: Supply municipal facilities with onsite renewable energy Measure Revision: None GHG Avoided Calculation Update: <ul style="list-style-type: none"> 2030 electricity use is lower than previously projected 	481	746
WE-1: Complete water rate study and implement new water rates Measure Revision: <ul style="list-style-type: none"> Description: Complete water rate study with on average 6.5% water rate increase annually. Performance Metric: Reduce water use by 2,400 acre-feet by 2030. GHG Avoided Calculation Update: <ul style="list-style-type: none"> Water use 2030 is lower than previously projected Water-energy intensity (energy used to supply, treat, and distribute water) is lower than previously estimated 	795	735
CET-1: Complete and implement the Citywide Active Transportation Plan Measure Revision: none Updated Measure Description: The implementation of Active Transportation Plan (ATP) with the Housing Element Update build-out is estimated to lead to a 9% shift in bicycle mode share and 8% shift in walk mode share within the vicinity of ATP projects. Updated performance metric:	254	Not quantified

CAP Measures	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)	2030 GHG Avoided in the 2018 CAP (MT CO ₂ e)
<ol style="list-style-type: none"> Complete the Active Transportation Plan by 2020. Complete Active Transportation Plan Projects by 2030 and avoid 800,000 miles driven in 2030. GHG Avoided Calculation Update: <ul style="list-style-type: none"> Quantified the GHG avoided from ATP 		
CET-2: Implement a local shuttle system Measure Revision: None GHG Reduction Calculation Update: <ul style="list-style-type: none"> Updated due to revised average vehicle emission factor in latest VMT and emissions model EMFAC2017 (previously EMFAC2014) 	178	172
CET-3: Update the City's circulation element to improve traffic flow Measure Revision: None GHG Avoided Calculation Update: <ul style="list-style-type: none"> Fuel savings per intersection were reduced to correct the previous over-estimation 	1,241	2,839
CET-4: Require residential electric vehicle charging stations Measure Revision: None GHG Avoided Calculation Update: <ul style="list-style-type: none"> More multi-family units due to the HEU Miles driven by electric vehicles were updated based on the latest VMT and emissions model EMFAC2017 (previously EMFAC2014) 	260	1,357
CET-5: Require commercial electric vehicle charging stations Measure Revision: None GHG Avoided Calculation Update: <ul style="list-style-type: none"> More new and retrofitted commercial square footages based on latest permit data Miles driven by electric vehicles were updated based on the latest VMT and emissions model EMFAC2017 (previously EMFAC2014) 	3,582	1,789
MCET-1: Transition to efficient municipal fleet Measure Revision: Measure goal was adjusted to account for the impact of switching to all electric light-duty fleet (more gasoline fuel savings than previous goal) and the new addition of renewable diesel supply in 2019	384	166
OR-1: Adopt a Leaf Blower Ordinance to limit use of 2-stroke leaf blowers Measure Revision: None	142	142
ZW-1: Implement a Zero Waste Program Measure Revision: None GHG Reduction Calculation Update: <ul style="list-style-type: none"> New waste characterization study (2016 study from Oceanside) was used to calculate emissions from solid waste (previously used a default waste factor from GHG Protocol), which reduces emissions and emissions reduction from waste. Oceanside study provides a local waste characterization from which to more accurately estimate emissions reductions. 	9,216	11,921

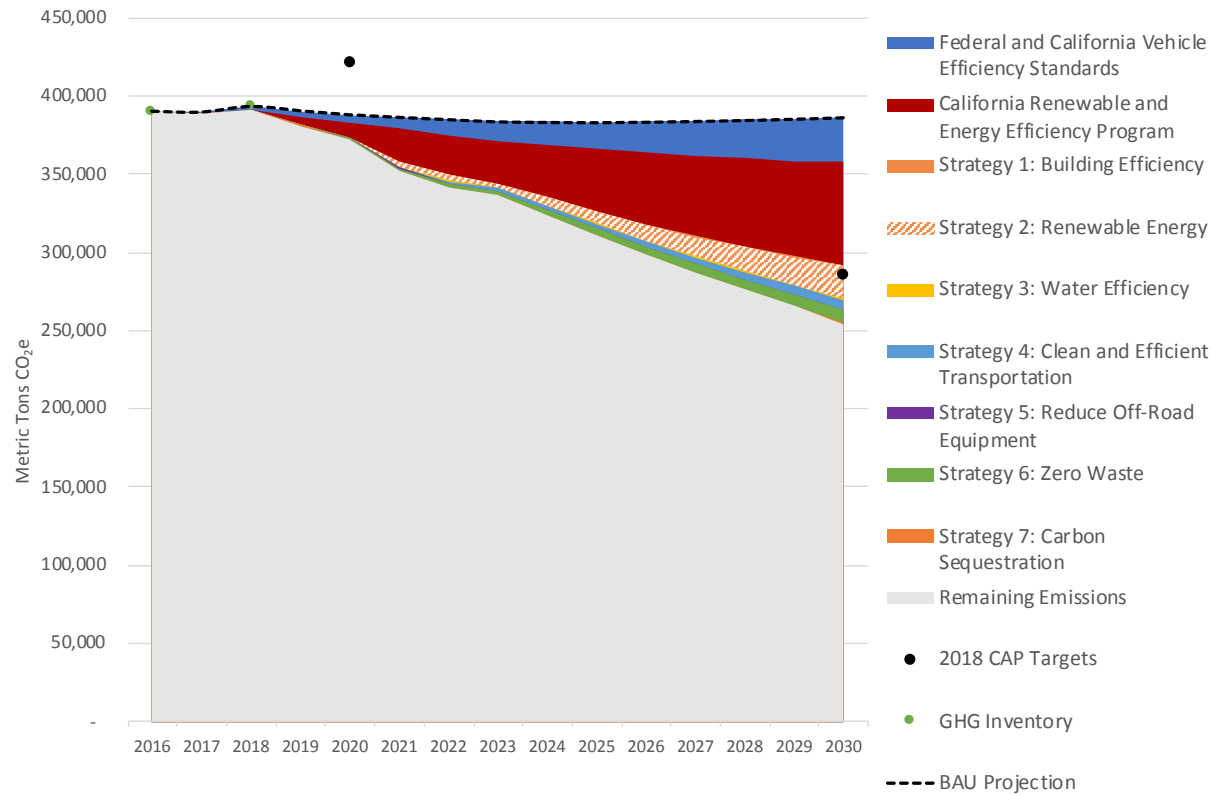
CAP Measures	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)	2030 GHG Avoided in the 2018 CAP (MT CO ₂ e)
CS-1: Develop and implement an Urban Tree Planting program Measure Revision: Measure goal increased to “plant 100 new trees annually”	66	23
Total GHG Emissions Avoided from CAP Measures:	37,725	68,955
*Preliminary results.		

Table 18 below shows a summary of the GHG avoided from each strategy and legislative actions in the 2018 CAP Update.

Table 18. Summary of GHG Avoided from Each CAP Strategy in the 2018 CAP Update

CAP Strategies	2030 GHG Avoided in 2018 CAP Update* (MT CO ₂ e)
Strategy 1: Building Efficiency	675
Strategy 2: Renewable Energy	20,935
Strategy 3: Water Efficiency	792
Strategy 4: Clean and Efficient Transportation	5,899
Strategy 5: Reduce Off-Road Equipment	142
Strategy 6: Zero Waste	9,216
Strategy 7: Carbon Sequestration	66
GHG Avoided from All CAP Strategies	37,725
GHG Avoided from Federal and State Regulations	94,041
Total GHG Avoided	131,765
*Preliminary results.	

Figure 5 provides a visualization of the emissions trend for the CAP horizon. the BAU emissions projection is represented along the top of the graph (dashed black line). The two black dots represent the 2020 and 2030 targets from 2018 CAP. The colored wedges represent the GHG avoided of each CAP strategy and of federal and state regulations. The bottom of the graph shows the remaining emissions after all the actions have taken place over time.



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Figure 5. Encinitas GHG Emissions Trend Through 2030

With the revised emissions projection, legislative actions and CAP measures, the City meets both the 2020 and 2030 targets. The effect of plan actions on the City's emissions and target is summarized in Table 19.

Table 19. Effect of Plan Actions on Encinitas Emissions and Targets

GHG Emissions and GHG Emissions Avoided	2030
BAU Emissions Projection (1)	386,341
GHG Avoided from Legislative Actions (2)	94,041
Legislative-adjusted BAU Emissions Projection (3) (1 minus 2)	292,300
2018 CAP GHG Targets (Percent Below 2012)	41%
Target Emissions	285,426
GHG Avoided from All CAP Measures (4)	37,725
Encinitas Emissions with 2018 CAP (3 minus 4)	254,575
Target Achieved?	Yes

4.1 NEW MEASURES TO BE ADDED TO THE 2018 CAP:

In addition to the CAP revisions, the City plans to add a new CAP measure:

New CAP Measure MCET-2: Adopt a Municipal Employee Telecommute Policy

The new measure MCET-2 will fall under the Strategy 4: Clean and Efficiency Transportation.

Measure description: The city will adopt a municipal employee telecommute policy. The policy will identify and provide incentives to employee with telecommute jobs to telecommute at least two days a week by 2030.

Performance Metric: Avoid municipal employee commute miles by 170,000 in 2030.

GHG Avoided: 50 MT CO₂e in 2030

The following CAP Supporting Measures will also be added to the CAP:

Strategy 1: Building Efficiency

- Support the state's efforts to enact decarbonization legislation.
- Educate homeowners and businesses on decarbonization, building electrification, and electric appliance options.

Strategy 4: Clean and Efficient Transportation

- Develop building regulations that support bike parking and the installation of bike racks, including covered bike parking/storage and allowing bike parking spaces to contribute to a development's overall parking count.
- Install traffic infrastructure enhancements that support biking and walking. Could include bike sensors and associated street markings to indicate the location of the sensor, pedestrian detectors at intersection, cross walks, traffic bollards, etc.

- Implement a monitoring program for assessing biking, walking and transit ridership in the City to determine the baseline level of travel and facilitate the development of appropriate mode shift targets for the City.
- Complete the Modal Alternatives Plan to support this design and installation of the bike and pedestrian projects identified in the Active Transportation Plan.
- Expand the City employee alternative commute program to include incentives to commute by bicycle, walking, carpooling, or electric vehicle, as approved by City Council.

Strategy 6: Zero Waste

- Transition to an online permitting system to eliminate paper waste from the printing of permit applications and associated development project plans.

5. UPDATED 2012 INVENTORY AND OPTIONS TO UPDATE TARGET EMISSIONS LEVEL IN 2030

5.1 UPDATED 2012 GHG INVENTORY

As discussed in Section 2.2 *Comparison of Emissions by Category*, key data sources in on-road transportation and solid waste category are updated that affect the BAU projection. The updated data sources also affect 2012 baseline inventory. To be consistent with the latest 2016 GHG inventory and BAU projection method, the 2012 baseline inventory is revised as follows:

- 2012 vehicle tailpipe emission rates were updated with data from EMFAC2017, instead of EMFAC2014 (the previous model). EMFAC2017 emissions results provide the latest available fleet characteristics, reflecting improved fleet efficiencies and electric vehicle sales. As a result, the updated 2012 vehicle emission rate is 458 g CO₂e/mile, instead of 483 g CO₂e/mile. This change leads to a reduction in on-road transportation emissions for 2012.
- The mixed waste emission factor from the latest 2016 inventory was used as a proxy for the 2012 inventory, instead of a default mixed waste emission factor from ICLEI U.S. Community Protocol. The updated mixed waste emission factor is likely more representative for Encinitas than a default factor and represents the most recent data source. As a result, the updated 2012 mixed waste emission factor is 0.98 MT CO₂e/wet short ton, instead of 1.5 MT CO₂e/wet short ton. This change leads to a reduction in emissions from the solid waste category in the 2012 inventory.

All other data sources used for 2012 baseline inventory are still the best available data as of this 2018 CAP Update. Because of the updated vehicle emission rate and mixed waste emission factor, the 2012 baseline GHG inventory is revised to be 459,000 MT CO₂e, instead of 483,773 MT CO₂e.

5.2 OPTIONS TO UPDATE TARGET EMISSIONS LEVEL IN 2030

Option 1: Keep the target, of 41% below 2012 by 2030, but update 2030 target emissions level based on the updated 2012 baseline emissions level

Because the 2012 GHG inventory is updated, the target emissions level in 2030 equivalent to 41% below the 2012 baseline is updated accordingly to be 271,000 MT CO₂e. With the 2018 CAP Update, the emissions level after all CAP measures is projected to be 254,575 MT CO₂e, still meets the 2030 target.

Option 2: Set the 2030 target emissions level to achieve what is possible after implementing all CAP measures

The measures have been updated or new measures added that are expected to be feasible for the City to implement. Therefore, a second option is to set the 2030 target at the emissions level after all CAP measures, 254,575 MT CO₂e, which is equivalent to 44% below the updated 2012 inventory by 2030.

The results of both options are shown in Table 20 and Figure 6.

Table 20 Options to Update 2030 Target Emissions Level

Year	Business-as-usual Projection (MT CO ₂ e)	Target Emission Level (% below baseline 2012)	Target Emission Levels (MT CO ₂ e)
2012	459,000 (Revised Inventory)		
2020	388,000	-13%	399,000
2030	386,000	-41% (Option 1)	271,000
		-44% (Option 2)	255,000

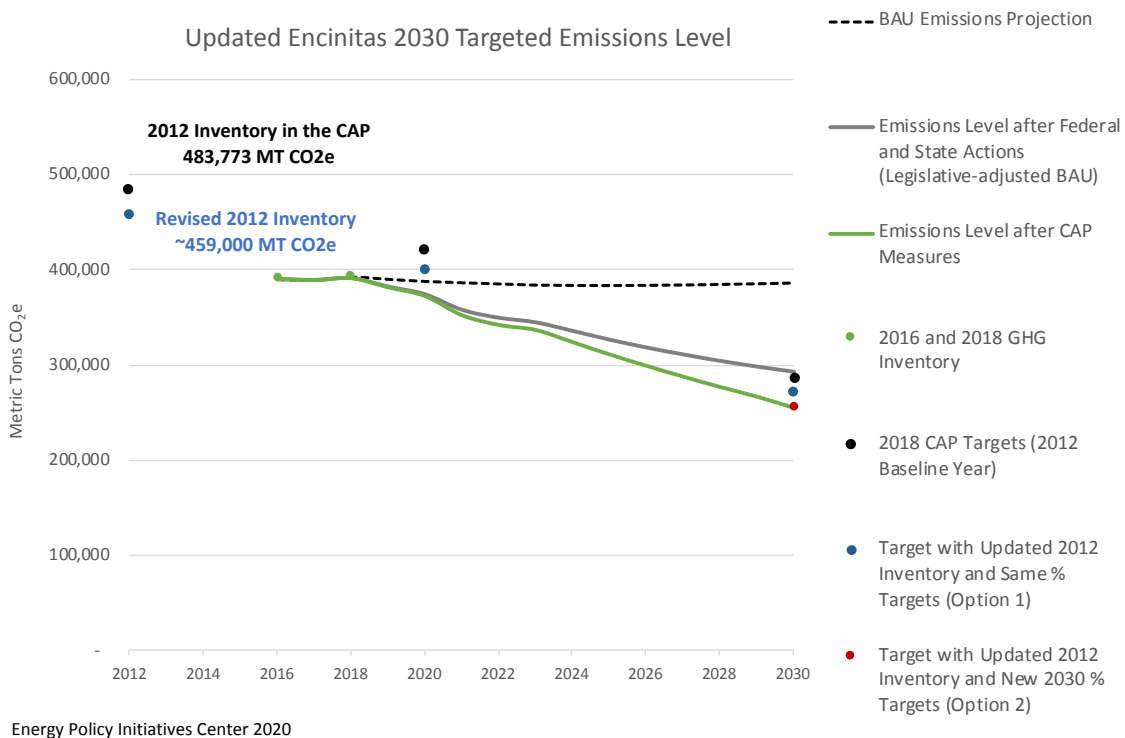


Figure 6 Options to Update 2030 Target Emissions Level

Appendix A. AVOIDED VEHICLE MILES TRAVELED FROM ACTIVE TRANSPORTATION PLAN PROJECTS

The Active Transportation Plan (ATP) was drafted in November 2018. The plan documents Encinitas' existing bikeway and walkway systems and recommends new projects to improve the systems. Based on the ATP, locations of higher housing or employment densities would tend to be the most cost-effective for active transportation projects because they provide the most potential users for a given area. The ATP also indicates that most future bicycle and walking activities are likely to originate from within residential areas, with the most common trip destinations being schools and parks, followed by commercial, retail and employment centers.

The ATP provides a list of 63 proposed bicycle and pedestrian projects, which together would provide a much improved network of multimodal connectivity and encourage more residents to use active modes of transportation (walk and bicycle) in lieu of a vehicle. This document details the methods used to estimate the potential vehicle miles traveled (VMT) associated with projects in the ATP, corresponding greenhouse gas reductions, and the potential change in mode share due to the ATP in combination with the new housing units included in the 2018 housing element update (HEU). Results are summarized at the end and can inform greenhouse gas (GHG) reduction estimates for the City's climate action plan (CAP) update.

A.1 Methods and Inputs

A1.1 Vehicle Miles Traveled Methods and Inputs

Estimates for avoided VMT were found using the following equation:

Equation A1. Annual VMT Avoided

$$\text{Annual VMT Avoided} = X_{\text{walk}} * 2\beta_{\text{walk}} * \omega_{\text{walk}} + X_{\text{bike}} * 2\beta_{\text{bike}} * \omega_{\text{bike}}$$

Where,

X = housing units within the pedestrian/bicycle zones

β = median one-way trip distance in miles to activity center

ω = number of trips per household per year to activity center.

Trip Distance and Frequency

Trip distance is measured as the one-way distance in miles individuals are willing to travel using a given mode of transportation to each activity center¹⁷ identified. Trip frequency is measured as the number of trips made by households, using a given mode of transportation, to each activity center annually. National Household Transportation Survey (NHTS) data¹⁸ were used to estimate the travel distance and frequency by pedestrian and bicycle modes of travel (Table A1). As an example, from Table A1, pedestrians are willing to walk a median one-way distance of 0.3 miles to *Food & Dining* activity centers, and would do this, on

¹⁷ The Encinitas ATP groups 'points of interest' near ATP project areas into one of three major activity centers: (1) business, (2) recreation, and (3) public/education/community. To align with NHTS data, these activity centers were reclassified into six categories: food & dining, other general errands, recreation, religious & community activities, retail goods & services, and school. A seventh category was added—transit—using data available through SanGIS for transit access locations (e.g., bus stops, train stations).

¹⁸ Federal Highway Administration (2019). [2017 National Household Transportation Survey – California Add-on](#). National Renewable Energy Laboratory. Accessed 14. Feb 2020

average, 13.6 times per year. Bicycle riders are willing to ride a median distance of 0.9 miles to *Food & Dining* activity centers areas, but less than once per year.

Table A1. Trip Distance and Frequency Estimates

Activity Center Category	Pedestrian		Bicycle	
	Median Trip Distance (mi)	Trip Frequency (trips/unit/yr)	Median Trip Distance (mi)	Trip Frequency (trips/unit/yr)
Food & Dining	0.3	13.6	0.9	0.9
Other General Errands	0.3	3.9	1.2	0.3
Recreation	0.4	7.5	1.5	1.1
Religious & Community Activities	0.3	0.8	1.2	0.1
Retail Goods & Services	0.5	14.2	1.9	0.7
School	0.5	3.8	1.1	0.4
Transit	0.3	3.3	1.3	0.5

Energy Policy Initiatives Center, 2020

Housing Units

ArcGIS was used to determine travel distance ‘zones’ for each activity center category using the median pedestrian and bicycle travel distances provided in Table A1.¹⁹ An example of travel distance zones developed are provided in Figure A1. The number of housing units within each zone were then estimated using parcel level data obtained through SanGIS for the City of Encinitas only. Housing units were estimated using two scenarios: (1) using existing housing stock conditions and (2) under full buildout of the 2018 HEU (Table A2). Appendix C of the HEU was used to modify existing parcel data to determine the number of units per parcel under full buildout of the HEU.

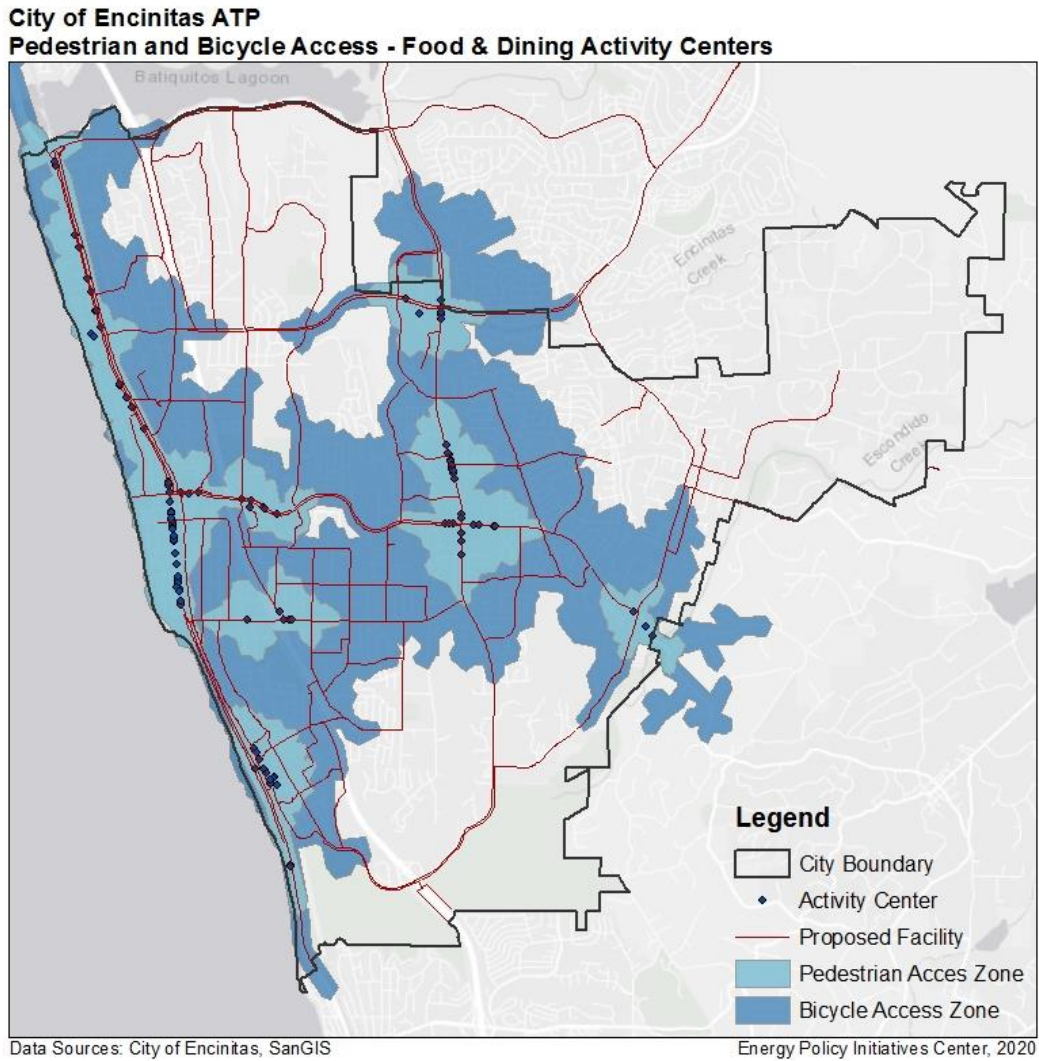
Table A2. Housing Units within Pedestrian and Bicycle Zones

Activity Center Category	Pedestrian		Bicycle	
	Current Stock (# units)	HEU Buildout (# units)	Current Stock (# units)	HEU Buildout (# units)
Food & Dining	9,634	10,734	21,386	23,168
Other General Errands	3,215	3,506	15,873	16,948
Recreation	15,121	16,439	27,387	29,607
Religious & Community Activities	9,531	10,640	22,386	24,383
Retail Goods & Services	18,602	20,060	27,407	29,627
School	16,671	18,046	23,132	24,769
Transit	13,811	15,526	26,331	28,459

Energy Policy Initiatives Center, 2020

¹⁹ Zones were defined using travel distances along defined routes (roads, pathways, pedestrian bridges, etc.) and not “as the crow flies.”

Figure A1. Pedestrian and Bicycle Access Zones - Food & Dining Activity Centers



A1.2 Greenhouse Gas Reduction Methods and Inputs

Estimates for avoided VMT were found using the following equation:

Equation A2. GHG Reductions

$$GHG\ Reduction = VMT_{avoided} * EF_{vehicle} * 10^{-6}$$

Where,

$VMT_{avoided}$ = annual VMT avoided from ATP projects

$EF_{vehicle}$ = vehicle emission factor

10^{-6} = grams to metric ton conversion factor

Vehicle Emission Factor

An average vehicle emission factor was identified using the California Air Resources Board (CARB) Mobile Source Emissions Inventory EMFAC2017 model.²⁰ Modeled data for average vehicle in 2030 were used to calculate the 2030 emission factor identified in Table A3.

Table A3. Average Vehicle Emission Factor in 2030

	Emission Factor (g CO ₂ e/mile)
Average 2030 Light-Duty Vehicle Fleet	304

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A1.3 Mode Share

Current mode shares within the City of Encinitas are not known. Without this data, it is not possible to establish a baseline to assess the potential shifts in mode share as a result of ATP projects. However, a more limited analysis can be done that estimates the potential increase in mode share associated with full buildout of the HEU and ATP projects.

Estimates for mode share changes as a result of the HEU and ATP were found using the following equations:

Equation A3. Mode Share

$$Mode\ Share_{housing\ scenario} = \frac{VMT_{avoided}}{VMT_{2030}} * 100$$

Where,

$Mode\ Share_{housing\ scenario}$ = mode share estimate using data for each housing scenario

$VMT_{avoided}$ = annual VMT avoided from ATP projects (pedestrian or bicycle mode)

VMT_{2030} = SANDAG Series 13 estimate for VMT in 2030 for miles traveled within Encinitas

Equation A4. Percent Change in Mode Share

$$Mode\ Share\ \% \ Change = \frac{(Mode\ Share_{HEU} - Mode\ Share_{Current\ Stock})}{Mode\ Share_{Current\ Stock}} * 100$$

Where,

$Mode\ Share_{HEU}$ = mode share estimate under the HEU (pedestrian or bicycle)

$Mode\ Share_{Current}$ = current housing stock mode share estimate (pedestrian or bicycle)

SANDAG Series 13 2030 VMT Estimate

SANDAG Series 13 origin-destination VMT and projections from 2012 were provided by SANDAG and used in development of the 2018 CAP. VMT data is categorized as either all internal miles (I-I), where the start and end point of the trip is within Encinitas, or internal-external miles (I-E), where the start or end point of the trip is outside of Encinitas. For this analysis, it is assumed that all mode share impacts of the ATP associated with the HEU will be for trips that start and end in Encinitas (I-I) only. The I-I VMT estimate for the City of Encinitas in 2030 is provided in Table A4.

²⁰ California Air Resources Board (CARB) (n.d.). [EMFAC2017 Web Database v1.0.2](#). Accessed 8. May 2020

Table A4. SANDAG Series 13 Internal-Internal Trip VMT

	2030 VMT Estimate
Internal-Internal (I-I) Trip VMT	72,332,744

Provided by SANDAG, Energy Policy Initiatives Center, 2020

A.2 Results

A2.1 Vehicle Miles Traveled Avoided

Inputs provided in Table A1 and Table A2 were applied using Equation A1 to calculate VMT avoided that is associated with ATP projects. Results are provided in Table A5 using current housing stock estimates and in Table A6 under the full buildout of the HEU. Increased housing density as a result of the HEU in areas with increased access to active transportation options will lead to an increase in VMT avoided by about 66,000 miles per year.

Table A5. VMT Avoided by ATP Projects – Current Housing Stock Estimates

Activity Center Category	VMT Avoided, Pedestrian (mi/yr)	VMT Avoided, Bicycle (mi/yr)	Total VMT Avoided (mi/yr)
Food & Dining	75,331	34,273	109,604
Other General Errands	6,431	11,007	17,438
Recreation	80,578	88,127	168,706
Religious & Community Activities	4,733	3,055	7,788
Retail Goods & Services	257,144	65,978	323,122
School	62,153	17,977	80,129
Transit	27,635	35,067	62,702
All Categories	514,004	255,484	769,488

Energy Policy Initiatives Center, 2020

Table A6. VMT Avoided by ATP Projects – Full Buildout of HEU

Activity Center Category	VMT Avoided, Pedestrian (mi/yr)	VMT Avoided, Bicycle (mi/yr)	Total VMT Avoided (mi/yr)
Food & Dining	83,933	37,129	121,061
Other General Errands	7,013	11,753	18,765
Recreation	87,602	95,271	182,873
Religious & Community Activities	5,284	3,327	8,611
Retail Goods & Services	277,298	71,322	348,621
School	67,279	19,249	86,528
Transit	31,066	37,901	68,967
All Categories	559,474	275,952	835,426

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A2.2 Greenhouse Gas Emissions Avoided

The VMT avoided estimates provided in section 3.1 for both housing stock scenarios were used to estimate GHG avoided using Equation A2. Results are provided in Table A7. Under full buildout of the HEU

and with all ATP projects in place by 2030, the total GHG avoided is 254 MT CO₂e in 2030.²¹ This is 20 MT CO₂e more than if no additional housing units were built going forward.

Table A7. GHG Avoided in 2030 from ATP Projects Under Current Housing Stock and Full Buildout of HEU

Housing Scenario	VMT Avoided (mi/yr)	GHG Avoided in 2030 (MT CO ₂ e)
Current Housing Stock	769,488	234
Full Buildout of HEU	835,426	254

Energy Policy Initiatives Center, 2020

A2.3 Mode Share

The VMT avoided results provided in section 3.1 for both housing stock scenarios and both modes of travel (pedestrian and bicycle) were used to estimate the percent change in mode share associated with full build-out of the HEU together with the ATP using Equation A3 and Equation A4. Results are provided in Table A8. As a result of full build-out of the HEU and with all ATP projects in place by 2030, there is an estimated 9% increase in pedestrian mode share and 8% increase in bicycle mode share.

Table A8. Percent Change in Mode Share from ATP and HEU

	Pedestrian	Bicycle
Mode Share – Current Stock in 2030	0.71%	0.35%
Mode Share – HEU Build-Out in 2030	0.77%	0.38%
Percent Change in Mode Share	8.85%	8.01%

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A.3 Areas for Further Assessment

Results included here can be further refined and/or additional assessment can help to better understand the impact of ATP projects on VMT within the City of Encinitas. This includes, but is not limited to:

- Conducting city-wide surveys to collect data on commuter preferences in and around ATP project areas (e.g., trip distances, commute mode, and number of employees);
- Conducting city-wide surveys to collect data on mode shares to establish a baseline;
- Conducting city-wide surveys to better understand the correlation between active transportation modes (e.g., pedestrian and bicycle) and mass transit (e.g., bus or train); and
- Review literature to better understand the impact of relatively new travel modes (e.g. electric bikes) on the average distance and frequency travelers are willing to go without a vehicle.

²¹ GHG reductions are expected to be higher if all commuter miles to the ATP area were to be included in the analysis. This analysis is based only on the data available in the ATP. The ATP does not distinguish between travel for work and travel for non-work, that is, the ATP does not specifically call out commuters even within ATP areas. In addition, it does not include commuters from other areas of Encinitas and outside of Encinitas traveling to the ATP area. Therefore, there is currently insufficient data to support an analysis to evaluate the potential mode shift in commuter miles due to the ATP.

Appendix B. SUMMARY OF NEW CONSTRUCTION ELECTRIFICATION ORDINANCES

Many jurisdictions in California are considering the electrification of the residential and non-residential building stock to achieve greenhouse gas (GHG) mitigation goals. Across the state, several approaches have been adopted by jurisdictions to encourage or require electrification. This document summarizes the extent to which building electrification has been advanced through local ordinances.

Currently, there are three categories²² of electrification ordinances that have been adopted in California—a natural gas ban, an all-electric reach code, and an electric-preferred reach code. A natural gas ban and all-electric reach code both require all (or most) of the building to be electric. While these two types essentially achieve the same outcome, they differ in how the requirement is mandated. An all-electric reach code goes through the typical process for adopting an ordinance that advances and goes beyond current state building standards (Title 24). This process requires approval from the California Energy Commission (CEC) after being adopted by city council and requires a showing of cost-effectiveness. A natural gas ban, however, is mandated using the jurisdiction’s police powers (health and safety of residents) and does not require CEC approval. Electric-preferred ordinances allow for mixed-fuel development, but typically require a higher energy design rating—greater energy efficiency—relative to an all-electric building.

These ordinances may also apply to one or more building type—single family and low-rise (up to three stories) multifamily, high-rise multifamily, and nonresidential buildings. Table B1 identifies the number of electrification ordinances currently adopted²³ in California by ordinance type and by the type of building the ordinance applies to. Of these, all apply to new construction only, except for an ordinance adopted by the City of Richmond, which requires the electrification of certain equipment in single family and low-rise multifamily units at the time of replacement or upgrade. A complete list of current electrification related ordinances in California is provided at the end of this document (Table B9).

Table B1. Number of Electrification Ordinances in California by Building Type¹

Building Type ²	Natural Gas Ban	All-Electric Reach Code	Electric-Preferred Reach Code
Single Family and Low-Rise Multifamily	4	14	14
High-Rise Multifamily	2	8	14
Nonresidential	2	8	14

¹ The number of ordinances includes those that have been approved by the CEC or have been submitted to the CEC for approval as of 8/30/20.

² Some ordinances may affect more than one building type and the requirements (e.g., all-electric or electric-preferred) may differ by building type

Energy Policy Initiatives Center, 2020

²² These categories are identified here as they are by the California Energy Codes and Standards Program.

²³ All ordinances included have been approved by the CEC as of 8/30/2020 with the exception of two. These two have been adopted by their local councils and are now in the approval process at the CEC.

B.1 Exceptions to All-Electric Requirements for New Construction

Within natural gas bans and all-electric reach codes, there are exceptions where natural gas can be used. This section identifies those exceptions in current ordinances for residential (single family, low-rise multifamily, and high-rise multifamily) and nonresidential construction.

B1.1 Residential Construction

Exceptions identified for single family and low-rise multifamily units are provided in Table B2 and high-rise multifamily units in Table B3. Half of the ordinances with all-electric requirements for single family and low-rise multifamily units include exceptions (9 out of 18). This is similar for high-rise residential ordinances (6 out of 10). A common thread among most of these exceptions is that space and water heating are required to be electric, while natural gas is allowed for cooktops and fireplaces but both must in any case be prewired for electric.

Table B2. Exceptions for Single Family and Low-Rise Multifamily Natural Gas Use in Residential All-Electric Ordinances

Jurisdiction ¹	Exception(s)
Berkeley	Determined on a case-by-case basis when all-electric is not feasible or project determined to be in public interest, but must pre-wire for electric
Campbell	All-electric space/water heating. Natural gas OK for other uses, but must pre-wire for electric
Brisbane	Exception for cooktops/fireplaces, but must pre-wire for electric
Healdsburg	Exception for cooktops, fireplaces, pool/spa, but must pre-wire for electric
Menlo Park	All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces, but must pre-wire for electric
Mountain View	Exception for cooktops/fireplaces but must pre-wire for electric. Exception for for-profit kitchen cooking equipment in low-rise multifamily units
Pacifica	Exception for cooktops/fireplaces but must pre-wire for electric. Exception for for-profit kitchen cooking equipment in low-rise multifamily units
Los Altos Hills	All-electric space/water heating (including ADUs). Natural gas OK for other uses, but must pre-wire for electric
Richmond	All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces, but must pre-wire for electric
Saratoga	All-electric space/water heating. Natural gas OK for cooktops, fireplaces, clothes dryer, but must pre-wire for electric

¹ The Cities of Berkeley and Campbell adopted natural gas bans, all others are all-electric reach codes.

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Table B3. Exceptions for High-Rise Multifamily Natural Gas Use in Residential All-Electric Ordinances

Jurisdiction ¹	Exception(s)
Healdsburg	Exception for cooktops, fireplaces, pool/spa but must pre-wire for electric
Mountain View	Exception for F, H, and L occupancies and for-profit kitchen cooking equipment
Pacifica	Exception for cooktops/fireplaces butt must pre-wire for electric.
Los Altos Hills	All-electric space/water heating (including ADUs). Natural gas OK for other uses but must pre-wire for electric
Richmond	All-electric space/water heating and clothes dryers. Natural gas OK for cooktops/fireplaces but must pre-wire for electric
Saratoga	All-electric space/water heating but must pre-wire for electric

¹ Ordinances included here are all all-electric reach codes.

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B1.2 Nonresidential Construction

Exceptions identified for nonresidential construction are provided in Table B4. Most nonresidential all-electric requirements have some type of exception included. The more common exceptions identified include fire and public safety buildings, for-profit kitchen cooking equipment, and specialized facilities such as laboratories. However, many ordinances still require these facilities to pre-wire for electric.

Table B4. Exceptions for Natural Gas Use in Nonresidential All-Electric Ordinances

Jurisdiction ¹	Exception(s)
Berkeley	Determined on a case-by-case basis when all-electric is not feasible or project determined to be in public interest, but must pre-wire for electric
Brisbane	Exception for life science occupancies and gas specific for for-profit kitchens
Cupertino	Exception for fire, high-hazard, laboratory, and “essential facilities” occupancies, but must pre-wire for electric
Healdsburg	Exception for cooktops, fireplaces, pool/spa, essential services, and technical processes, but must pre-wire for electric
Mountain View	Exception for fire, high-hazard, and laboratory occupancies; and for-profit kitchen equipment
Pacifica	Exception for fire and police occupancies; and for-profit kitchen cooking equipment
Richmond	Exception for fire, police, and life science occupancies; and for-profit kitchen cooking equipment, but must pre-wire for electric
San Mateo (County)	Exception for laboratories, emergency operations, and for-profit cooking (requires approval)
Saratoga	All-electric space/water heating except for public agency owned emergency centers, but must pre-wire for electric

¹ The City of Berkeley adopted a natural gas ban, all others are all-electric reach codes.

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B.2 Greenhouse Gas Avoided Estimates for New Construction in Encinitas

This section summarizes the GHG reduction potential for different electrification requirements that Encinitas may consider for adoption as they relate to both residential and nonresidential construction.

B2.1 Residential Construction

The potential to avoid GHG emissions from residential construction under certain electrification requirements are provided in Table B5. Calculations for the three electrification scenarios assume (1) that all new units proposed in the 2019 Housing element Update (HEU), 1,504 multifamily units, will be built by 2030; (2) that new units would be Title 24 code-compliant mixed-fuel homes were an electrification ordinance not in place; and (3) that all new units would use 100% renewable electricity in 2030, either through the Community Choice Energy Program (i.e., San Diego Community Power) or through on-site PV systems.

Table B5. Potential Greenhouse Gas Emissions Avoided in 2030 from Electrification Requirements in New Residential Development

Electrification Requirement	Number of New Multi-Family Units through 2030	Natural Gas Savings (therms/unit)	Electricity Increase (kWh/unit)	Net GHGs Avoided in 2030 from All Multi-Family Units (MT CO ₂ e)
All-electric requirement (no exemptions)	1,504	110	1,434	878
All-electric requirement (cooktops exempt)		100	1,304	790
Water heater electrification requirement only ¹		73	406	466

¹ Electrification of water heater appliances assumes all new construction installs a heat pump water heater (HPWH) in lieu of a tankless natural gas system.

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All-Electric Requirement – No Exemptions

Under this electrification scenario, a natural gas ban or all-electric reach code is adopted without exceptions, meaning all new residential units will be wholly all-electric. This assumes that each new unit is a Title 24 code-compliant all-electric home and would result in 878 MT CO₂e in 2030. The GHG avoided is estimated for the year 2030 only, not the cumulative impact of building electrification from the time of ordinance adoption through 2030. Depending on when each residential unit is electrified, the cumulative impacts from each year's natural gas savings and GHG avoided through 2030 would be significantly greater than the impacts in 2030 alone.

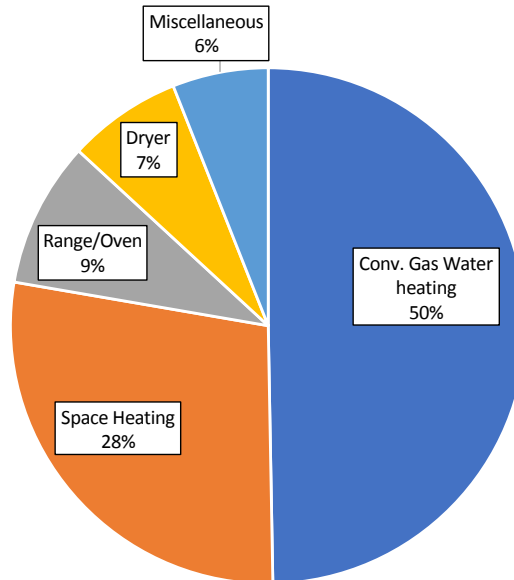
The GHG avoided in 2030 are due solely to the natural gas use avoided, and not electricity use. The additional electricity use from switching a mixed-fuel home to an all-electric home is 1,434 kWh, but with 100% renewable electricity in 2030, no emissions are added.

All-Electric Requirement – Cooktops Exempt

The second scenario, modifies the all-electric requirement with an exception for cooktops. With this exception added, it is assumed that all new units would be Title 24 code-compliant all-electric homes, but with a natural gas cooktop. The GHGs avoided as a result would be 790 MT CO₂e in 2030, about 9% less than GHGs avoided under the first scenario.

Most residential indoor natural gas end-use is for water heating and space heating. As shown in Figure B1, in the SDG&E service area, more than 78% of indoor natural gas use at homes is for water heating and space heating. Natural gas use used for cooking appliances, such as a range or oven, is about 9% of the indoor natural gas end-use.

SDG&E Service Area Residential Natural Gas End Use - All Homes
Source: 2010 California Residential Appliance Saturation Survey



Data do not include pool and spa heating energy use.

Figure B1. Indoor Natural Gas End-Use Breakdown at Residential Units (SDG&E Service Area, 2010)

Water Heater Electrification Requirement Only

The third scenario, is the least stringent electrification requirement and requires only the water heating system to be electrified. Here, it is assumed that all new units would be Title 24 code-compliant mixed-fuel homes with an electric heat pump water heater (HPWH). As noted in Figure B1, water heating accounts for roughly 50% of residential natural gas consumption. The GHGs avoided as a result of a water heater electrification requirement would be 466 MT CO₂e in 2030, about 47% less than GHGs avoided under the first scenario.

B2.2 Nonresidential Construction

The potential to avoid GHG emissions from nonresidential construction under a water heater electrification requirement is provided in Table B5. This initial analysis only examines the electrification of water heating equipment for new nonresidential development. The CAP currently includes two other measures for nonresidential development—BE3 and RE3—and including a more stringent electrification requirement would require more detailed analysis to examine the interactions between these three measures. Calculations assume (1) that new development would be Title 24 code-compliant mixed-fuel construction with an electric HPWH and (2) that all new units would use 100% renewable electricity in 2030, either through the Community Choice Energy Program (i.e., San Diego Community Power) or through on-site PV systems.

Table B6. Potential Greenhouse Gas Emissions Avoided in 2030 from Electrification Requirements in New Nonresidential Development

Electrification Requirement	New Commercial Space through 2030 (sq.ft.)	Natural Gas Savings (therms/sq.ft.)	Electricity Increase (kWh/sq.ft.)	Net GHGs Avoided in 2030 (MT CO ₂ e)
Water heater electrification requirement only ¹	1,000,000	0.02	0.23	97

¹ Electrification of water heater appliances assumes all new construction installs a heat pump water heater (HPWH) in lieu of a tankless natural gas system.

Energy Policy Initiatives Center, 2020

B.3 Additional Considerations for Electrification

In addition to the GHG avoided potential of electrification ordinances, there are other considerations that may help to inform whether or not an electrification ordinance should be adopted. Included here are a discussion on cost and co-benefit considerations. These are not meant to be an exhaustive set of considerations, but to provide a general overview as identified in current literature.

B3.1 Cost Considerations

The California Energy Codes & Standards Program commissioned two cost-effectiveness studies—one for residential²⁴ and one for nonresidential²⁵ development—that evaluate the specific building requirements in new development, including electrification. The following sections identify key cost considerations reported in each of the statewide studies.

Residential Development

The residential study found an all-electric requirement to be cost-effective and code-compliant in climate zone 7, which covers Encinitas, both for a code compliant home and for an energy efficiency and increased PV sizing requirement.²⁶ Results of this analysis are provided in Table B7 and indicate that the upfront construction costs are lower in an all-electric home in comparison to a mixed-fuel baseline. The largest driver of this cost difference is the avoidance of natural gas infrastructure costs. When not paired with increased energy efficiency measures and an increase in PV size, utility costs are expected to increase by approximately \$14 a month for single family units and \$6 a month for a multifamily unit. Adding energy efficiency and increasing PV size, however, provide a net savings for monthly utility bills of \$9 for single family \$7 for multifamily units.

²⁴ Frontier Energy and Mist Bruceri & Associates (2019). 2019 Cost-effectiveness study: Low-Rise Residential New Construction. California Energy Codes & Standards Program

²⁵ TRC and EnergySoft (2019). 2019 Nonresidential Construction Reach Code Cost Effectiveness Study. California Energy Codes & Standards Program

²⁶ The analysis assumed a 30-year useful life for nonresidential development.

Table B7. Residential Electrification Cost-Effectiveness Results

	Single Family Home	Multifamily Dwelling Unit
All-Electric 2019 Code Compliant Home		
Incremental package cost ¹	(\$5,349)	(\$2,337)
Lifecycle utility cost savings ¹	(\$5,134)	(\$2,094)
Net present value ²	\$215	\$243
Benefit-Cost Ratio	1.0	1.1
All-Electric + Energy Efficiency + Increased PV		
Incremental package cost ¹	(\$912)	(\$75)
Lifecycle utility cost savings ¹	\$3,174	\$2,611
Net present value ²	\$4,086	\$2,686
Benefit-Cost Ratio	> 1	> 1

¹ Values in parentheses () indicate a cost savings for the incremental package cost and a net utility cost for lifecycle utility cost savings.

² Assumes a 15-year useful life.

Source: Frontier Energy and Mist Bruceri & Associates (2019). *2019 Cost-effectiveness study: Low-Rise Residential New Construction*. California Energy Codes & Standards Program

Energy Policy Initiatives Center, 2020

Nonresidential Development

The nonresidential study found an all-electric requirement to be cost-effective and code-compliant in climate zone 7, which covers Encinitas, when paired with an energy efficiency and/or PV and battery storage requirement.²⁷ Results of this analysis are provided in

²⁷ The analysis assumed a 15-year useful life for nonresidential development.

Table B8 and indicate that, when combined with just an energy efficiency requirement, the upfront cost is substantially lower than mixed-fuel construction. For the office and retail prototypes, the largest driver in cost reductions is the avoidance of costs associated with natural gas infrastructure in the building (connecting a service line, piping, and monthly connection utility charges). For the small hotel, the largest driver in cost reductions is the reduced cost of an all-electric HVAC and water heating system relative to the mixed-fuel baseline. The battery component of the PV and battery requirement can add significant costs; however, this requirement achieves the greatest utility cost savings.

Table B8. Nonresidential Electrification Cost-Effectiveness Results

	Medium Office (53,628 sq.ft.)	Medium Retail (24,691 sq.ft.)	Small Hotel (42,552 sq.ft.)
All-Electric + Energy Efficiency Requirement			
Incremental package cost ¹	(\$3,676)	(\$18,193)	(\$1,266,354)
Lifecycle utility cost savings ¹	\$256,704	\$127,461	(\$81,338)
Net present value ²	\$260,380	\$145,654	\$1,185,015
Benefit-Cost Ratio	> 1	> 1	15.6
All-Electric + Energy Efficiency + PV + Battery Requirement			
Incremental package cost ¹	\$327,079	\$256,478	(\$1,058,983)
Lifecycle utility cost savings ¹	\$870,156	\$550,714	\$197,711
Net present value ²	\$543,076	\$294,236	\$1,256,694
Benefit-Cost Ratio	2.7	2.1	> 1

¹ Values in parentheses () indicate a cost savings for the incremental package cost and a net utility cost for lifecycle utility cost savings.

² Assumes a 15-year useful life.

Source: TRC and EnergySoft (2019). *2019 Nonresidential Construction Reach Code Cost Effectiveness Study*. California Energy Codes & Standards Program

Energy Policy Initiatives Center, 2020

B3.2 Co-Benefits

In addition to avoiding greenhouse gas emissions and reducing cost burdens, there are several other benefits that have been identified through recent studies including job creation and resiliency.

Job Creation

A 2019 study²⁸ by the UCLA Luskin Center for Innovation (LCI) analyzed the workforce implications for building electrification in California. Highlights of their study include:²⁹

- Creation of an additional 100,000 full-time workers would be required by 2045 in the construction industry;
- Creation of an additional 4,900 full-time workers would be required by 2045 in the manufacturing industry;
- Creation of an additional 12,400 full-time electricity generation and distribution jobs and 5,400-6,800 fewer full-time gas distribution jobs; and
- The reduction in natural gas use in the commercial and residential sectors can be achieved through reducing gas imports, negating impacts on in-state extraction jobs.

Resiliency

Beyond job creation and economic development, studies have identified the potential to increase community resiliency through electrification. Typical resiliency co-benefits identified include:³⁰

- Reduce in indoor air pollution from burning natural gas indoors;
- Reduce methane leaks both within homes and along distribution lines; and
- Reduce fire risk and delays in power restoration during natural disasters (e.g., earthquakes).

²⁸ Jones et al. (2019). [California Building Decarbonization Workforce Needs and Recommendations](#). UCLA Luskin Center for Innovation. PDF

²⁹ Findings assume electrification is implemented state-wide.

³⁰ SF Environment (2019). *Focus 2030: A Pathway to Net Zero Emissions*. City of San Francisco

B.4 Current Electrification Ordinances in California

Table B9 identifies the current electrification ordinances in California. These include natural gas bans, all-electric reach codes, and electric-preferred reach codes. For each, the type of construction for which the ordinance applies is identified.

Table B9. Current Electrification Ordinances in California

Jurisdiction	Natural Gas Ban	All-Electric Reach Code	Electric-Preferred Reach Code
Berkeley Ord. No. 7678-N.S.			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
Berkeley Ord. No. 7672-N.S.	Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential		
Brisbane Ord. No. 643		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Campbell Ord. No. 2260	Single Family Low-rise Multifamily		
Cupertino Ord. No. 19-2193		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Davis Ord. No 2565			Single Family Low-rise Multifamily
Hayward Ord. No 20-05			High-Rise Multifamily Nonresidential
Hayward Ord. No 20-05		Single Family Low-rise Multifamily	High-Rise Multifamily Nonresidential
Healdsburg Ord. No. 1196		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Los Altos Hills Ord. No. 589			Single Family Low-rise Multifamily
Los Gatos Ord. No. 2299		Single Family Low-rise Multifamily	
Marin (County) Ord. No. 3712			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
Menlo Park Ord. No. 1057		High-Rise Multifamily Nonresidential	Single Family Low-rise Multifamily
Mill Valley Ord. No. 1313			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential

Jurisdiction	Natural Gas Ban	All-Electric Reach Code	Electric-Preferred Reach Code
Milpitas Ord. No. 65.148			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
Morgan Hill Ord. No. 5906	Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential		
Mountain View Ord. No. 17.19		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Pacifica Ord. No. 852-CS		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Palo Alto Ord. No. 5485			High-Rise Multifamily Nonresidential
Palo Alto Ord. No. 5485		Single Family Low-rise Multifamily	High-Rise Multifamily Nonresidential
Richmond Ord. No. 06-20 NS		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
San Francisco Ord. No. 003-20			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
San Jose Ord. No. 30311			High-Rise Multifamily Nonresidential
San Jose Ord. No. 30330	Single Family Low-rise Multifamily		
San Luis Obispo Ord. No. 1684			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
San Mateo Ord. No. 2019-9			Single Family (inc. duplexes) Nonresidential (office only)
San Mateo (County) Ord. No.		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Santa Cruz Ord. No. 2020-06		Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential	
Santa Monica Ord. No. 2617			Single Family Low-rise Multifamily

Jurisdiction	Natural Gas Ban	All-Electric Reach Code	Electric-Preferred Reach Code
			High-Rise Multifamily Nonresidential
Santa Rosa Ord. No. 2019-019		Single Family Low-rise Multifamily	
Saratoga Ord. No. 366			Single Family Low-rise Multifamily High-Rise Multifamily Nonresidential
Windsor Ord. No. 2019-338		Single Family Low-rise Multifamily	

Energy Policy Initiatives Center, 2020