CAP Appendices

The following Draft Climate Action Plan Appendices are included in this document for public review:

Appendix 01

Community Outreach and Engagement

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Introduction

Purpose

Public participation was an integral part of the County of San Diego's (County) Climate Action Plan (CAP) Update process. This Community Outreach and Engagement Appendix establishes the goals and strategies that shaped public participation for the CAP Update process and outlines the many opportunities the public and stakeholders had to participate throughout the project timeline. In addition, it identifies a variety of tools and techniques that the County used to maximize public participation and create meaningful opportunities for the public to provide input that shaped the CAP's development. This appendix is a roadmap of how we worked to keep the public and stakeholders informed about the project and describes ways we mobilized people to participate. This appendix also includes summaries of the outreach phases and associated activities and explains how they supported key milestones in the CAP Update process.

Background

On January 13, 2021, the Board of Supervisors (Board) approved policy guidelines for the CAP Update to be "shaped by community input and center environmental justice", which included conducting stakeholder engagement. The Board also established that the CAP Update should set clear goals and measurable metrics that show how the project ensures environmental justice and equity. This appendix demonstrates how we met the policy guidelines set forth by our Board.

COVID-19 Public Health Order

Part of the CAP Update process took place during the COVID-19 pandemic and outreach and engagement efforts had to be tailored accordingly. San Diego County and California public health officials issued orders (to varying degrees between 2020 through 2023) to prevent the spread of COVID-19 that limited in-person gatherings, such as public workshops, community events, and other large gatherings, which are typically the foundation of public participation efforts. As such, the CAP Update process relied on other ways of conducting public participation, such as virtual public workshops, webinars, electronic surveys, online meetings, and phone calls. Once health orders were lifted, we integrated in-person events and meetings back into the outreach and engagement process. However, the pandemic also highlighted new ways of engaging with the public and we continued to utilize digital and analog tools to expand our reach.

Picture 1: We heard directly from residents in the County-identified Environmental Justice Communities at a series of workshops held early in the process. This photo is from a pop-up at the Provence House in Sweetwater.

Geographic Reach

The unincorporated area of the county has a 2019 modified population of 479,844, making it the second most populous geography in the region. Although the unincorporated area represents a large population, it is highly geographically disparate and amorphous in community character and demographics. The unincorporated area is home to 28 distinct communities that vary from suburban densities and scales in locations adjacent to neighboring incorporated cities, to lower density rural communities surrounded by hillsides, deserts, and agricultural lands. The most developed communities are located along the unincorporated territory's westernmost boundaries and have access to water, sewer, roads, schools, and other public facilities.

Equity

We took various approaches to support the Board's priority to center environmental justice and equity in the CAP Update process. Equity was a primary focus of our outreach and engagement efforts and encouraging participation from individuals and groups that are underrecognized in the County's planning processes was critical to the CAP Update process. Significant emphasis was placed on developing ways that the County can obtain the input of underrecognized groups and solicit diverse feedback so that many different perspectives were considered. This section of the Community Outreach and Engagement Appendix describes different types of equity that informed the development of the outreach and engagement efforts and guided the CAP Update; establishes terminology related to equity; and describes considerations for equity as it relates to public participation for the CAP Update (e.g., language, socioeconomic status, access to technology, availability of resources/time).

Picture 2: We tabled at various Movies in the Park events (this photo is from Pine Valley County Park) hosted by the Department of Parks and Recreation.

Guiding Principles

The primary focus of the outreach and engagement efforts for the CAP Update is to ensure that people who live and work in the county have an opportunity to provide input on the project. The following guiding principles further describe how this goal was realized through the CAP Update process. Equity is also a guiding principle and is defined within our approaches.

Awareness

The public and stakeholders must be aware of the CAP Update process before they can participate.

Education
The public and stakeholders must be educated and knowledgeable about the CAP Update process to participate effectively.

Input
All perspectives and feedback are valued and should be considered as part of the CAP Update process.

Empower
Build capacity and empower the public and stakeholders to participate in the CAP Update process.

Transparency and Accountability
Having a clear process, communicating openly, and creating opportunities for the public and stakeholders to participate builds trust with the County and fosters support for the CAP Update process.

Approaches
Outreach and engagement took into consideration different forms of equity, including the three ways to incorporate equity into the planning process as identified in the California Adaptation Planning Guide: procedural, distributional, and structural.

- **Procedural equity** is about creating outreach, engagement, and involvement processes that are transparent, fair, and inclusive. It focuses on increasing opportunities for engagement and ownership in decision-making, in all aspects of climate action planning, by the communities that are disproportionately impacted by and most vulnerable to climate change.
- **Distributional equity** is about the fair distribution of resources, benefits, and burdens that result from climate action planning decisions. Distributional equity means prioritizing the allocation of finite resources and designing planning strategies to benefit communities that experience the greatest climate and environmental inequities and have the most unmet environmental health needs, while also ensuring that these communities do not disproportionately experience economic, social, or environmental burdens because of such planning decisions.
- **Structural equity** involves making planning decisions that recognize and address the underlying structural and institutional systems that are at the root of economic, social, and racial inequities. It is an approach to decision-making that overtly seeks to correct past harms and to anticipate and prevent future unintended consequences for disadvantaged social and racial groups. An approach based on structural equity examines whether planning decisions to achieve climate resilience also eliminate poverty, create workforce development opportunities, address racism, increase civic participation and social cohesion, protect housing availability and affordability, increase educational outcomes, and improve public health outcomes.

Outreach and engagement efforts were also guided by the County's General Management System (GMS). The GMS includes equity as a value and as a strategic initiative, which are described as follows:

- Equity as a value means applying an equity lens to appropriately design programs and services so that underserved communities have equitable opportunities. Using data driven metrics, lived experiences and the voices of our community we weave equity through all policies and programs.
- Equity as a strategic initiative provides a framework for health, housing, and economic opportunity.
  - **Health**
    - Reduce disparities and disproportionality and ensure access for all through a fully optimized health and social service delivery system and upstream strategies.
    - Focus on policy, systems and environmental approaches that ensure equal opportunity for health and well-being through partnerships and innovation.
  - **Housing**
    - Utilize policies, facilities, infrastructure, and finance to provide housing opportunities that meet the needs of the community.
  - **Economic Opportunity**
    - Dismantle barriers to expanding opportunities in traditionally underserved communities and businesses, especially communities of color and low income.
    - Advance opportunities for economic growth and development to all individuals and the community.

Terminology

The following terms are defined to provide a common understanding of equity as it relates to the CAP Update.

- **Underrecognized Communities**: Refers to communities that are not recognized to the same extent as their peers due to social structures that have conditioned us to overlook and undervalue them, often refers to BIPOC (Black, Indigenous, and People of Color) communities.
- **Environmental Justice Communities**: As part of the County of San Diego's General Plan Environmental Justice Element (EJ Element), the County has identified specific Environmental Justice Communities (EJ Communities) within the unincorporated area. The County's methodology for identifying EJ Communities includes the State recommended CalEnviroScreen 3.0 combined with localized data measuring health, wellness, and equity available through the County's Live Well San Diego initiative. Using this data at a census tract level, the County identified 17 total census tracts that were grouped into four distinct EJ Communities: North El Cajon, North Lemon Grove, Spring Valley, and Sweetwater. For the purposes of CAP Update outreach, the term EJ Communities only refers to these communities within the County's land use jurisdiction.

- **Frontline Communities**: Communities that will experience climate change, "first and worst." These disproportionate impacts are due to social indicators such as having low income, high unemployment, low levels of homeownership, high rent burden, low levels of educational attainment or are linguistically isolated, and often include unsheltered, older adults, persons with disabilities, communities of color, and sensitive populations (populations with elevated asthma rates, cardiovascular disease, and low birth-weight infants as defined by the Office of Environmental Health Hazard Assessment and used for CalEnviroScreen 3.0).

Considerations

Several factors related to equity were considered when developing outreach and engagement opportunities to maximize participation and ensure that many different perspectives were included. The following considerations were meant to address procedural and structural impediments that shape opportunities to provide input and other factors that affect the ability for people to equitably participate.

Convenience

Because people are busy and have many activities (e.g., family, work, school) competing for time and attention, it was important to offer multiple opportunities for people to participate at different times and locations. To achieve this, we presented at virtual meetings hosted by other

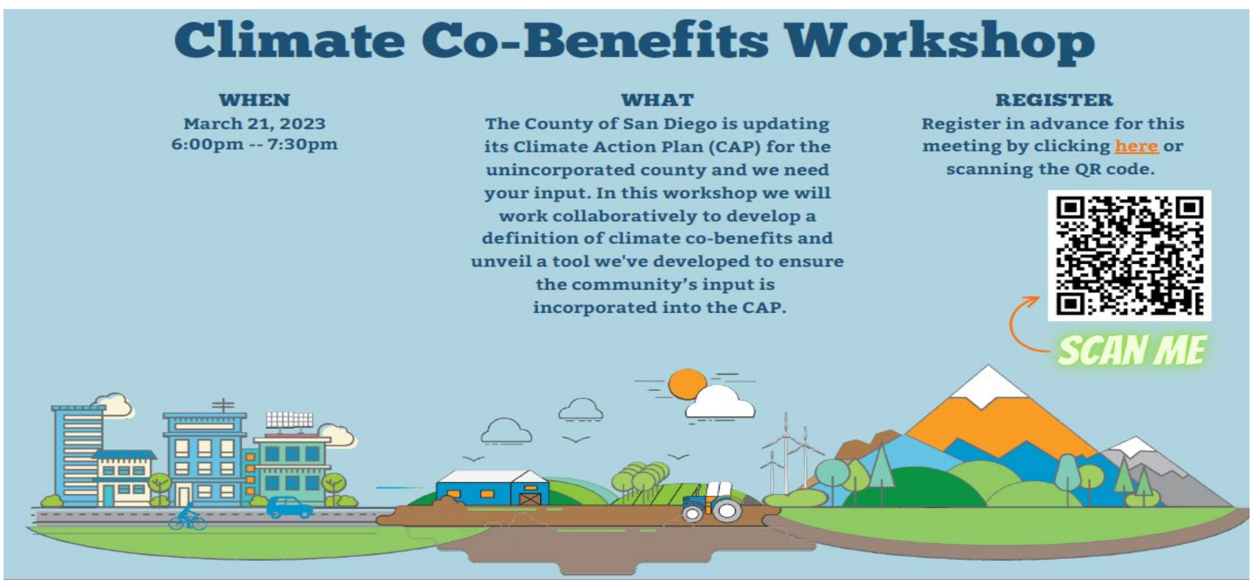
Picture 3: We had lots of rich and diverse conversations at various community events like those pictured here at the Lakeside Library, Julian Library, Spring Valley Day, and Pine Valley County Park (clockwise starting from upper left).

community-based organizations such as the Farmworker CARE Coalition, facilitated by Vista Community Clinic. We also attended community-led events held within unincorporated communities such as Spring Valley Day and the Ramona Earth Day. Additionally, we popped up at sites where we knew community members would be such as at the opening of the new Lakeside Library and during a food distribution at the Julian Library.

Language and Literacy

Considering the diversity of the unincorporated area, we also wanted to make sure non-English speakers had an opportunity to participate in the CAP Update process. Staff participated in the County's Translation, Language, and Culture Connection Workgroup which received a California State Association of Counties Challenge Award for their efforts to provide guidance on best practices regarding culturally sensitive, accurately translated, trauma-informed, and accessible communications for multilingual, diverse San Diego communities. For example, all online communication about the CAP Update was shared in eight County-identified threshold languages (Arabic, Chinese, Farsi/Persian, Korean, Spanish, Somali, Tagalog, and Vietnamese). Additionally, we provided Spanish simultaneous interpretation at all virtual workshops.

Reaching people with limited literacy in English and/or lower educational attainment also presents a challenge for public participation. People may not be able to read complex planning



Picture 4: Example of a simple flyer we used for promotion of our co-benefits workshop.

jargon and technical terms to understand the importance of the CAP Update and how it may impact them. Therefore, we made sure our communication materials were graphicly rich and clearly presented information about who, what, where, when, and why a meeting is being held. An Example from our Climate Co-Benefits workshop is included here.

Age

Older adults and youth have specific needs that should be considered, and their voices are important to elevate since they are more likely to be impacted by climate change. We made a concerted effort to ensure we heard from these populations. To reach older adults, we partnered with the County's Aging & Independence Services (AIS) to help distribute prepaid postcards through their existing meal delivery services. To reach youth, we contacted principals and teachers at all twenty of the high schools in the unincorporated area. From this outreach we were able to provide in-person presentations to five high schools and an online presentation to the general membership of the Sunrise Movement, which is a youth-focused climate justice group. Findings from presentations to high schools can be found in the CAP's Outreach and Engagement Chapter (Chapter 2).

Picture 5: Students at Mountain Empire Unified High School District received a lesson on climate change and the CAP and shared personal narratives on their thoughts and feelings regarding climate action.

Digital Divide

The digital divide has demonstrated the unequal access to digital technology, especially the internet. To bridge the gap resulting from a reliance on digital tools, we developed an analog survey. The hardcopy survey postcards were printed with prepaid postage, so all recipients had to do was fill them out and return by mail. The postcards were disseminated through all eighteen library branches in the unincorporated area, at in-person events we attended, through the County's AIS network, and at the County's Community Planning & Sponsor Group meetings.

Local History

Public participation for the CAP Update occurred within the context of a long history of complex relations between government entities and communities and many communities and individuals have participated in previous planning processes. Those who have participated may not have seen the change that was proposed or promised or did not see the outcome they desired. In addition, many communities and individuals may have been overlooked and were not included at all. Others may have participated but may not have felt comfortable participating or may not have felt understood. As much as possible, we took time to acknowledge the complex history with the County in our workshops and presentations and brought in other related, but adjacent, planning and program efforts to provide participants with a holistic

Picture 6: We participated in a clean-up in Fallbrook co-hosted by I Love a Clean San Diego and Fallbrook Beautification

perspective on the work being done. For instance, we made references to other ongoing County planning efforts as part of the conclusion of our workshops to inform participants of other opportunities for them to plug into and we had representation from other departments (e.g., the Office of Sustainability and Environmental Justice) at some of our workshops and events.

Cultural Norms

There are many different ethnic and cultural groups from around the world represented in the county. In some cases, this may mean that people are less willing to participate in government decision-making and they may be less comfortable openly sharing ideas and opinions. Cultural norms are nuanced and varied, and often take time to understand. Working with trusted community leaders and partnering with community-based organizations can help bridge divides and create opportunities for everyone to participate in a way they are comfortable with. As an example, we worked with the Partner Relay Network, a network of organizations that serve limited-English proficient populations across the region, to provide an overview of the CAP Update and how the communities they serve could get involved.

Picture 7: We invited partners like the Resource Conservation District of Greater San Diego County to share resources during a Land Management Workshop.

Accessibility

We made sure our materials were provided in an accessible manner to people with disabilities. This includes the information we provided online and in virtual formats. For example, our social media posts include image accessibility descriptions. In addition, at in-person meetings that we led, we worked to ensure that the meeting locations met the requirements of the Americans with Disabilities Act (ADA).

Equity Implementation Framework

In addition to the efforts outlined here, we developed an Equity Implementation Framework to identify the environmental justice and equity goals and metrics for the CAP Update. The Equity Framework was developed in alignment with the County's Office of Sustainability and Environmental Justice and Office of Equity and Racial Justice and was based off best management practice research of equity-based climate action plans. To support the development of the Equity Framework, we focused concerted outreach and engagement with socio-economic and equity-based organizations. More information about the Equity Implementation Framework will be made available in a forthcoming appendix.

Stakeholders

Stakeholders include "any individual, group of individuals, organizations, or political entity with a stake in the outcome of a decision."[1]

[1] https://www.iap2.org/page/ethics

Picture 8: We attended a gathering hosted by the California Alliance with Family Farmers at Terra Madre Gardens to hear directly from local agricultural producers.

Stakeholder Categories

For the purposes of this outreach and engagement document, stakeholders are broadly grouped into different categories to describe the diverse interests related to the CAP Update. Examples of the different stakeholder types are included to better illustrate the groups, but they are not meant to provide a comprehensive list.

Environmental Advocates

Environmental advocates include organizations and individuals across various sectors such as academia, nonprofits, etc. that value protection of the environment as their number one priority. These stakeholders likely had the most capacity to attend CAP Update events and workshops. Example organizations include Climate Action Campaign, the Sierra Club, San Diego 350, and Sustainable Ramona.

Business/Economic Development Organizations

Business and economic development organizations include organizations that represent the interests of businesses of various sizes. These stakeholders are likely interested in the CAP Update for its potential impacts on the business sector or doing business in San Diego. Example organizations include the various chambers of commerce, economic development councils, and business associations across the county.

Labor Groups

Labor groups include the local unions and the workers they represent as well as building industry groups. These stakeholders are likely interested in the CAP Update for its potential to impact trade industries and associated careers. Example organizations include United Association of Plumbers, Steamfitters & HVAC/R Local 230, San Diego & Imperial Counties Labor Council, and the San Diego County Building and Trades Council.

Equity Partners

Equity partners include those organizations that are focused on social justice issues and may or may not have an environmental justice lens to their work. Although their focus areas might not align perfectly with the CAP Update, through direct outreach we emphasized how important we think their participation is to the CAP Update. Example organizations include Vista Community Clinic, Community Health Improvement Partners, and the National Association for the Advancement of Colored People San Diego Branch.

Community Planning and Sponsor Groups

Community Planning and Sponsor Groups are responsible for reviewing various County planning projects, land development, and building projects to ensure they meet the general plan requirements and then make recommendations to the County depending on their analysis. Within the unincorporated area there are 18 Planning Groups and 10 Sponsor Groups, though not all are active. These stakeholders are invested to understand how the CAP Update will have an impact on the development of their communities.

Picture 9: We offered presentations to all the Community Planning and Sponsor Groups.

General Public

All members of the public have the opportunity learn about the CAP Update and provide input that is considered as part of the process. As detailed in this appendix, we have implemented ways to maximize participation and promote engagement so that participation overall represents a subset of the county's population.

Phases of Public Participation

The CAP Update outreach and engagement efforts were organized into four main phases that were coordinated with project milestones. Below each phase description are detailed activities and their intended purpose within the phase.

Figure 1 Developing a Community-Informed Climate Action Plan

Establishing an Equitable Approach

Initial outreach occurred while work on the CAP Update was in the beginning stages. Initial outreach activities included hosting virtual public workshops, updating the project website, creating an introductory video, and developing a project flyer.

The County also conducted other activities that established a foundation for ongoing outreach and engagement, including developing an overall strategy and range of activities to connect with stakeholders. Key outcomes included identifying potential partners and stakeholders; testing messages and communication strategies that were anticipated to drive engagement and reach new audiences and stakeholders; receiving feedback on potential engagement strategies; and increasing the number of subscribers on the project mailing list. A key deliverable was an internal stakeholder database that helped us track contact information, points of contact, and input received.

Public Participation Plan

Type of Activity:	Strategy and Research
Date(s):	First draft produced in November 2021
Description:	The Public Participation Plan was an internal document that guided public participation for the CAP Update process. This broad-based Public Participation Plan supported the County in identifying community needs and perspectives, facilitating robust discussion to create mutual understanding, and result in meaningful input for the CAP Update. The Public Participation Plan established guiding principles to facilitate the process, addressed barriers to participation to ensure all members of the public and stakeholders have an opportunity to provide input, and identified tools and techniques that were coordinated with milestones in the CAP Update process (all of which are included in this appendix).

Stakeholder Research and Identification

Type of Activity:	Strategy and Research
Date(s):	Ongoing
Description:	Internal stakeholder research and identification was conducted to identify stakeholders that have been involved in previous County planning efforts such as the 2018 CAP updates to the County General Plan's Housing Element and Safety Element, and creation of the Environmental Justice Element. Research also identified additional stakeholders with an interest in the CAP Update, either based on their connection to climate change, underrepresented communities, or that have a strong connection to unincorporated areas in the county. Stakeholder research and identification was integrated into an initial version of the stakeholder database.

Stakeholder Database

Type of Activity:	Strategy and Research
Date(s):	Ongoing
Description:	An internal stakeholder database was prepared to track and organize contact information from stakeholders that were identified through stakeholder research and identification. It was updated continually to include people who sign up for the mailing list and those who joined public participation activities throughout the CAP Update process. The database also includes information on stakeholder points of contact and input received.

CAP Update Kick-Off Virtual Workshop

Type of Activity:	Large Scale Outreach
Date(s):	April 21, 2021
Description:	This public workshop served to initiate the CAP Update project. A presentation was provided on the project background, objectives, components, and timeline. Throughout the presentation, attendees participated in the discussion through interactive polling questions, and staff answered questions throughout the presentation and during an open discussion session at the end of the event. See attachments for summaries of all workshops.

Equity-Focused Virtual Workshop

Type of Activity:	Large Scale Outreach
Date(s):	June 2, 2021
Description:	This public workshop offered a platform for discussion for the inclusion of equity in the CAP Update. Throughout the workshop, attendees participated in the discussion through interactive polling questions, and staff answered questions throughout the presentation and during an open discussion session at the end of the event.

Smart Growth Alternative Workshop

Type of Activity:	Large Scale Outreach
Date(s):	June 30, 2021
Description:	At this public workshop, the County presented an overview of the CAP Update, described our goals and objectives related to developing a smart growth alternative for inclusion in the Supplemental Environmental Impact

Report, and solicited feedback from attendees to aid in the development of smart growth alternatives for the project.

Measure Development Workshop Series - Sector Vision Statements

Type of Activity:	Large Scale Outreach
Date(s):	July 28, 2021, August 25, 2021, and September 29, 2021
Description:	The County held a three-part public workshop series during Summer/Fall 2021 to provide an overview of the CAP project components and act as a foundation for developing vision statements of an equitable, net-zero carbon emissions future within the energy, water and wastewater, solid waste, built environment and transportation, and agriculture and conservation sectors. Public input was solicited through interactive poll questions and discussion forum. Feedback received was used to inform the preparation of the vision statements.

Developing Measures

This second phase of the public participation process included a period of robust outreach and engagement activities that offered multiple and varied opportunities to provide input on the CAP Update. This phase of outreach was focused on collecting feedback on preliminary or potential ideas that were being considered by the County as part of the CAP Update including, but not limited to, GHG reduction measures. Key outcomes included gathering feedback from underrecognized communities through direct outreach within County-identified Environmental Justice Communities; feedback through large-format workshops on conceptual GHG reduction measures; and engagement touchpoints through community-oriented events.

Environmental Justice Community Workshops

Type of Activity:	Community-Centered Outreach
Date(s):	October 26, 2021, January 26, 2022, and February 6, 2022
Description:	The County conducted three workshops for intentional engagement within Environmental Justice Communities (EJCs) to gather input and recommendations for the CAP. EJCs are designated and defined in the San Diego County's Environmental Justice Element.

Spring Valley Earth Day Event

Type of Activity:	Community-Centered Outreach
Date(s):	April 23, 2022
Description:	Directly engaged with Spring Valley residents and other attendees around the topic of Earth Day and alignment with the CAP. Attendees asked questions and had access to informational materials.

Balboa Park Earth Day Event

Type of Activity:	Community-Centered Outreach
Date(s):	April 24, 2022
Description:	Directly engaged with event attendees around the topic of Earth Day and alignment with the CAP. Attendees asked questions and had access to informational materials.

Agricultural Community

Type of Activity:	Community-Centered Outreach
Date(s):	May 27, 2022, October 19, 2022, and November 10, 2022
Description:	Partnered with the California Alliance for Family Farmers, the Farmworker CARE Coalition, and the San Diego Farm Bureau to attend three events wherein we were able to connect directly with farmers and farmworkers and hear about their experiences with climate change and what actions they would like to see the County take relative to agriculture and conservation.

Measure Development Workshop Series – Draft Strategies and Conceptual Measures

Type of Activity:	Large Scale Outreach
Date(s):	June 1, 2022, June 15, 2022, June 28, 2022, July 19, 2022, and August 24, 2022
Description:	A series of five workshops that provided examples of draft strategies and conceptual measures to meet unincorporated area residents' vision of an equitable net-zero emissions future within the solid waste, water and wastewater, energy, agriculture and conservation, and built environment and transportation sectors. Each workshop provided an overview of the CAP Update project components and presented draft vision statements and conceptual measures for each sector. Public input was solicited through interactive poll questions and discussion forum.

Library Outreach

Type of Activity:	Community-Centered Outreach
Date(s):	July 21, 2022, and July 27, 2022

Description:	Partnered with San Diego Community Power at the Lakeside Library and Julian Library to provide information to residents about the CAP. Also collected feedback through a tallying system of which co-benefits were of greatest interest to community members.

Movies in the Park

Type of Activity:	Community-Centered Outreach
Date(s):	August 19, 2022, and October 22, 2022
Description:	Partnered with the Health and Human Services Agency and the Department of Parks and Recreation to host a table at movie screenings at Pine Valley County Park and Sweetwater Place County Park to provide information to residents about the CAP. Also collected feedback through a tallying system of which co-benefits were of greatest interest to community members.

Live Well San Diego Events

Type of Activity:	Large Scale Outreach
Date(s):	September 18, 2022, and December 7, 2022
Description:	Participated in two *Live Well San Diego* events – the *Live Well 5K* and the *Live Well Advance* – to share information to attendees about the CAP at a booth. Also collected feedback on which co-benefits were of greatest interest to community members and provided a more in-depth presentation at the *Live Well Advance*.

As-Requested Presentations and Meetings

Type of Activity:	Focused Outreach
Date(s):	Various
Description:	Provided over 50 presentations and/or answered questions at various stages of the CAP Update, as requested. Presentations and discussions were held with a variety of groups such as the Climate Action Campaign, San Diego 350, the Environmental Health and Quality Advisory Board, and Rincon, among others.

Prioritizing Community Input

This third phase was focused on continuing to find opportunities to engage directly with unincorporated area residents. This phase also looked at how to ensure community input was elevated in the CAP to the same level as other factors for consideration such as cost and GHG emissions reduction potential. This phase also began to collect input on implementation of CAP measures.

Youth-Focused / Schools Campaign

Type of Activity: Focused Outreach
Date(s): Outreach initiated in January 2023 and lessons were completed in May 2023
Description: Contacted all 20 high schools in the unincorporated area to offer to teach a Common Core-approved lesson on climate change, with additional information on the CAP Update process and the County government structure. The lesson was provided to five schools and one youth-focused climate justice group (Sunrise Movement). It included the collection of personal narratives to offer a practice-based learning opportunity and to learn more about students' climate change concerns, how they believe the County should work to address their concerns, and what their vision for the future is.

Multi-Platform Surveys (Online / Paper)

Type of Activity: Large Scale Outreach
Date(s): February – August 2023
Description: An online and hardcopy version of an 11-question survey was developed to better understand unincorporated area residents' perceptions and attitudes towards climate change, learn what co-benefits matter to them most, and verify what platforms people prefer to receive information (i.e., social media, newsletter, email, etc.) We received 563 responses to the survey through the web-based and hardcopy platforms.

Co-Benefits Virtual Workshop

Type of Activity: Focused Outreach
Date(s): March 21, 2023
Description: The workshop was an opportunity to work collaboratively with the public to develop a definition of climate co-benefits and discuss a tool that was under development to ensure the community's input was incorporated into the CAP. The workshop included representation from the Office of Sustainability and Environmental Justice and the Office Equity and Racial Justice to draw connections to our parallel efforts.

Lakeside Library Opening

Type of Activity: Community-Centered Outreach
Date(s): March 25, 2023
Description: Hosted a table at the opening of the new Lakeside Library to provide information to residents about the CAP.

Ramona Earth Day

Type of Activity:	Community-Centered Outreach
Date(s):	April 22, 2023
Description:	Directly engaged with Ramona residents and other attendees around the topic of Earth Day and alignment with the CAP. Attendees asked questions and had access to informational materials and surveys.

Spring Valley Day

Type of Activity:	Community-Centered Outreach
Date(s):	April 22, 2023
Description:	Directly engaged with Spring Valley residents at their inaugural *Spring Valley Day* event. Shared materials on the CAP and collected surveys.

Older Adult Outreach

Type of Activity:	Focused Outreach
Date(s):	May 2023
Description:	Partnered with Aging & Independence Services (AIS) to do direct outreach to older adults via meal sites they operate in coordination with other partners and contractors. Additional coordination was sought through presentations to the AIS Advisory Council and the AIS – Office of Military and Veteran Affairs – and Libraries Collaboration Meeting.

Presentations to Community Planning & Sponsor Groups

Type of Activity:	Focused Outreach
Date(s):	May – August 2023
Description:	Overview presentation offered to all the Community Planning & Sponsor Groups. Shared surveys and collected input and suggestions on the CAP and associated measures.

Final CAP

The last phase included the release of a comprehensive draft of the CAP Update to solicit feedback and comments. To collect input, we hosted the draft CAP on a web platform (Engage San Diego County) that allows for interactive, bi-directional engagement. We also facilitated a series of office hours and online workshops to walk readers through the CAP document to ensure comprehension of the materials. After public review of the draft CAP, we revised the CAP to reflect feedback we received and prepared the Final CAP. This final phase of the CAP

Update process will lead to the formal hearing process required for the County to adopt the CAP. Opportunities for public participation will occur as part of public hearings where the public and stakeholders can provide public comment to decision-makers.

Planning Commission Public Hearing

Type of Activity:	Public Hearings
Date(s):	September 2023
Description:	The Planning Commission held a hearing to make a formal recommendation on the CAP to the Board of Supervisors.

Public Review Virtual Workshop

Type of Activity:	Large Scale Outreach
Date(s):	October 2023
Description:	This workshop focused on raising awareness about the public review process and explaining how it works. This workshop also explained the associated documents.

Hybrid Office Hours

Type of Activity:	Large Scale Outreach
Date(s):	October 2023
Description:	Office hours were offered at standing times/days to provide the public and stakeholders opportunity to ask the County questions about the CAP. The focus of the office hours was on providing the public the necessary tools to offer feedback on the CAP.

Board of Supervisors Public Hearings

Type of Activity:	Public Hearings
Date(s):	Early 2024
Description:	A formal informational hearing took place in early 2024 to review the Draft CAP.

Continuous Communication

The following activities and resources were available throughout the length of the CAP Update process. These resources were intended to increase awareness about the CAP Update and drive people to act and participate while increasing knowledge and understanding about the purpose, components, and process of the CAP Update.

Project Website: https://www.sandiegocounty.gov/sustainability/climateactionplan.html

Type of Activity:	Informing and Mobilizing
Date(s):	All
Description:	The project website was a primary source of information about the CAP Update and features project updates as they occurred. In addition, the project website provided announcements about upcoming opportunities for public participation and included a sign-up for the project email list. The site was updated to reflect branding elements (logo, color palette, and tag line) selected for the CAP Update. Introductory homepage content on the purpose of the CAP Update was designed to use simple, compelling language that reinforces the value of the CAP Update to the region's residents. The site also hosts recordings, materials, and summaries of public workshops.

Email Updates to CAP / Planning & Development Services Department Email Lists

Type of Activity:	Informing and Mobilizing
Date(s):	All
Description:	The listserv was a tool to provide electronic project updates and reach stakeholders. Announcements about opportunities to participate in the CAP Update process were distributed through lists of 23,000+ contacts.

Digital Marketing and Social Media Campaign

Type of Activity:	Informing and Mobilizing
Date(s):	All
Description:	We developed and implemented a digital marketing and social media campaign to drive engagement with existing and new stakeholders. It was intended to increase awareness about the CAP, collect data about engagement, and result in social media that reaches key audiences. Posts on our Twitter, Facebook, and Instagram accounts included information on sustainability-related events in the unincorporated area, upcoming public participation opportunities, or sustainability-related educational items.

Flyers

Type of Activity:	Informing and Mobilizing
Date(s):	All
Description:	Fact sheets and flyers were created to provide relevant, specific project information about the CAP Update to share with the public and stakeholders. Fact sheets were also developed for specific CAP-related

programs (e.g., Carbon Farming Program) to disseminate information and encourage participation. Fact sheets were made available at all in-person events.

Video

Type of Activity:	Informing and Mobilizing
Date(s):	All
Description:	A video was developed to highlight information about the CAP Update process. The video was prominently featured on the homepage of our website and was used during some virtual workshops and meetings.

Board of Supervisors Memoranda

Type of Activity:	Public Hearings
Date(s):	Various
Description:	Progress updates were provided to the Board of Supervisors throughout the CAP Update process through direct memoranda. Once published, all memoranda were posted to our webpage for the public to access.

Workshop Summary Sheets

This document provides a summary of polling question responses and comments from participants captured at the first Climate Action Plan Update (CAP Update) workshop held on April 21, 2021. Summarized responses are provided for the five emission sectors of Built Environment & Transportation, Energy, Solid Waste, Water & Wastewater, and Agriculture & Conservation. All poll responses and written comments are available on the CAP Update website.

Built Environment & Transportation

Issue Area	Response/Comment	Number of Responders
Climate Change Impacts	Wildfires	7
	Drought	2
	Traffic	2
	Property Damage	1
	Supply Chain	1
Primary Mode of Transportation	Drive Alone	14
	Public Transit	2
	Bicycle	2
	Carpool/Vanpool	1
	Walk/Roll	1
	Motorcycle	1
	Other	2
Preferred Mode of Transportation	Public Transit	8
	Drive Alone	7
	Walk/Roll	6
	Bicycle	4
	Other	3
	Ride Share	1
	Motorcycle	1
Strategies to Implement	Install infrastructure for EVs, including DC Fast Chargers	20
	Reduce VMT (Driving Less)	16
	Support vehicles with alternative fuels	10
	Provide transportation options other than driving	6
	Reduce VMT through parking pricing measures	3
	Increase or mandate building electrification and green buildings	5
	Add affordable housing near jobs & transit	3
	Increase mass transit	3
	Add bike paths	2
	Develop Open Space & Parks	1
	Create carpool/Vanpool options	1

	Stop supporting road expansion projects	1
Other Important Issues	Center equity in built environment improvements	7
	Educate residents on individual actions for GHG reduction	1

Energy

Issue Area	Response/Comment	Number of Responders
Climate Change Impacts	Hotter Temperatures (more AC use)	6
	Utility Costs	3
	Utility Shutdowns	1
	Installed Solar Panels	1
Strategies to Implement	Energy Efficient Buildings	16
	Renewable sources of energy supplied to grid	14
	Renewable energy on existing buildings throughout the County	8
	Renewable energy at County-owned facilities	4
Other Important Issues	Air pollution (GHGs, health impacts)	4

Solid Waste

Issue Area	Response/Comment	Number of Responders
Climate Change Impacts	(none)	
Strategies to Implement	Increase recycling and composting	15
	Reduce waste generation	9
Other Important Issues	Backyard composting	1

Water & Wastewater

Issue Area	Response/Comment	Number of Responders
Climate Change Impacts	Drought	2
Strategies to Implement	Water efficient buildings/landscaping	11
	Reduce potable water use	5

Agriculture & Conservation

Issue Area	Response/Comment	Number of Responders
Climate Change Impacts	Wildfires	7
	Drought	2
Strategies to Implement	Plant more trees	14
	Carbon sequestration through agriculture	8
	Alternative fuels for agricultural equipment	1
	Discourage artificial growing of crops rather than more sustainable outdoor growing, especially as it relates to new cannabis rules	1

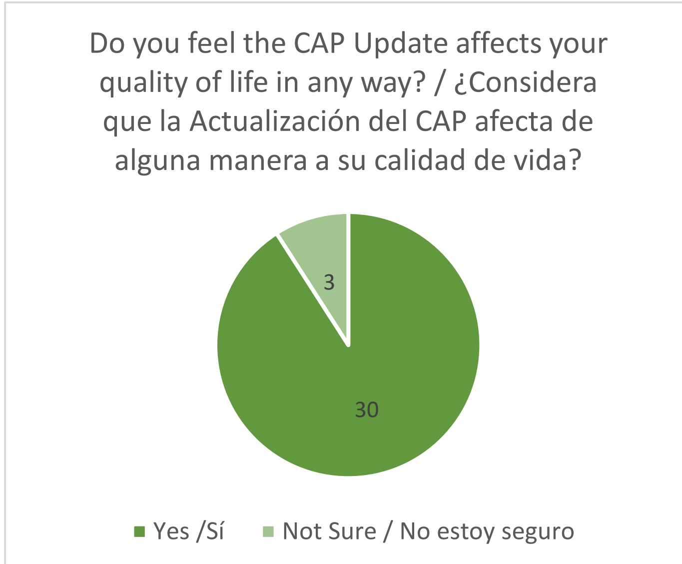
This document provides a summary of polling question responses and comments from participants captured at the second Climate Action Plan Update (CAP Update) workshop held on June 2, 2021. The workshop focused on how equity can be centered in the CAP Update project.

1. **In one word, what does a focus on equity in the CAP Update look like to you? / En una palabra, ¿cuál es su visión de un enfoque en la equidad en la Actualización del Plan de Acción Climática (CAP)?**

2. **In one word, what is your perception of the CAP Update? / En una palabra, ¿cuál es su percepción de la Actualización del CAP?**

3. **How the CAP Update Affects Quality of Life**
The vast majority (91%) of responders said that the CAP Update does affect their quality of life. Reasons for this impact included links between the environment and

communities, climate stabilization / the climate crisis, and potential impact on community resources like housing and transportation.
Responders who answered "yes" included the following additional thoughts:



- The environment is linked to our QOL.
- Determines how much gov agencies are required to care about certain communities in San Diego.
- It is an opportunity to improve our communities.
- It should improve everyone's quality of life.
- Pollution in the unincorporated areas doesn't stay there. Transportation is Countywide. Etc.
- Yes, to secure a livable planet for the next generation.
- Quality of our shared natural environment; quality of life for those of us in disadvantaged communities who are worst impacted by climate change.
- Under the legal concept of cumulative impacts, the CAP either supports climate stabilization or it ends most life forms on Earth. Your performance so far breaks my heart. I have 5 grandchildren.
- I hope it results in clean air to breathe.
- failure is not an option. We MUST resolve the climate emergency.
- We can't have healthy lives in an unhealthy environment.
- We are a cell in the body of the universe. We need to be a benign one.
- Access to transit and potential traffic
- Housing affordability (?)
- Global warming and weather patterns
- Will determine our collective future.

4. **Public Health Issues**
A majority of responders (85%) said that they or their community was experiencing public health issues. Air pollution and asthma were mentioned multiple times as issues of public concern.

Additionally, mental health concerns stemming from environmental and economic stress came up. Other health issues mentioned included water quality, heat, and wildfires. Solutions to address these public health issues included prioritizing air quality, electrifying the built environment and transportation, and working with communities and regional groups.

Are you or your community experiencing any public health issues? / ¿Usted o su comunidad tienen problemas de salud pública?	What are the specific issues or concerns that affect your community in San Diego County? / ¿Cuáles son los asuntos o preocupaciones específicos que afectan a su comunidad en el Condado de San Diego?	How can the County help address those issues, if any? / ¿Cómo puede el Condado abordar esos asuntos, si los hubiere?
Yes / Sí	Air pollution that causes respiratory issues or other health impacts	Planning and investing in electrifying transportation, and other sectors like home energy, busses, trucks, transit, cars.
Yes / Sí	Heat waves; increased air pollution leading to increased health issues such as asthma attacks	Prioritize air quality in the CAP update; incentivize EVs
Yes / Sí	Air pollution	Follow CARB solutions support Regional Transportation Plan
Yes / Sí	COVID and future pandemics due to loss of wild habitat and encroachment on wild areas	Allow county staff to telework as much as possible. preserve and rehabilitate wild areas. plant trees, improve public transport
Yes / Sí	Asthma	
Yes / Sí	Heat - Lack of trees/greenery. Surrounded by freeways - Air pollution. Lack of parks. Mental stress from all of these.	Work with SANDAG to reduce transportation pollution.
Yes / Sí	Air quality Border beach sewage	
Yes / Sí	Respiratory issues from natural gas in buildings and air pollution	Electrify new building developments Develop efficient, convenient mass transportation system
Yes / Sí	Air quality, especially wildfires	Ban 2 cycle engines, better wildfire management
Yes / Sí	Heat illness; air pollution; flooding impacts in remote areas; increasing wildfire threats in remote and urban areas	Have an aggressive CAP, and end land use sprawl
Yes / Sí	Humanity is on a path toward a devastating collapse of the human population. This is harming our mental health. It is very sad. The truth hurts and there is little hope of success.	Get real. This is a systems engineering problem driven by what the climate scientists specify.

Yes / Sí	Air pollution so extreme many employers are violating CAL OSHA laws	Eliminate ICE vehicles ASAP
Yes / Sí	Clean air and water	Better policies to better address and make the public aware of what we all collectively need to do to help preserve our community and our resources
Yes / Sí	Homeless destroying protected habitat	It can't if past is prologue
Yes / Sí	Air pollution, clean water	
Yes / Sí	Asthma	100% renewable energy. Electrify everything
Yes / Sí	Wildfires and the resulting air pollution.	Better wildland management on County owned land.
Yes / Sí	Pollution from transportation high VMT. Unhealthy buildings	Reduce VMT. Electrifying buildings.
Yes / Sí		Electric cars. The County will never have the density to support transit.
Yes / Sí	We live near the 15 freeway. The air quality during rush hour (am and pm) is terrible.	Light rail going to north county via SANDAG
Yes / Sí	Wildfires burned down homes in community Young people are increasingly experiencing genetic health impacts due to environmental issues	That's a big one. Wildfire resource help/prep, especially for people in older communities. Education on safe drinking water/health.
Yes / Sí	Campo--excessive heat throughout summer, especially when power is shut off.	
Yes / Sí	Increased frequency of asthma issues, increase in impacts from heat waves	Focus on the climate change and public health impacts, and climate adaptation
Yes / Sí	Air pollution from vehicles as I live within a 1/4 if freeways	Improve Transit and reduce VMTs
Yes / Sí	Asthma from all the air pollution and grime in the bay	Electric vehicles and make sure to regulate those who toy and alter their emissions with their emissions as many do who drive to the base every day thru IB
Not sure / No estoy seguro	Air quality, radiation	Better air quality measures and policies
Not sure / No estoy seguro	Wildfire	Better transit. Limiting building in very high fire risk areas.

5. Outreach & Engagement Best Practices

Accessibility, transparency, and trust were main points brought up when asked about involving the general public and underserved communities in CAP Update outreach strategies. Another area of emphasis was including diverse methods of outreach, including in-person with food, phone calls, small group or individual meetings, and social media.

How can we best involve you, as well as other individuals and organizations, in the CAP Update? / ¿Cuál es la mejor manera de involucrarlo a usted y a otras personas u organizaciones en la Actualización del CAP?	**What methods should the County consider to reach underserved communities? / ¿Qué métodos debe considerar el Condado para estar en contacto con las comunidades desatendidas?**
Be accessible and transparent to various communities. make the effort to get feedback from underserved groups, thread with other jurisdictions. work towards common goals	In person contacts that are culturally and linguistic appropriate. Look for the unseen and voiceless.
Build trust with community members and other organizations to work together with residents in Environmental Justice communities to prioritize investments and solutions there first. ; Have real incentives for providing input, food, compensation ; Demonstrate that community input will lead to some change and won't be ignored	Block parties.
Comments through email; opportunity for input at various geographical areas.	Co-host future meetings with community-based groups
Continue community engagement and outreach	Community meetings, churches, and schools
Continue to engage the community to keep us updated	Door-to-door and incentives.
Create an opportunity for individual input. the issues are too complex for preset Q&A	Engage non-profits, NGOs, faith groups who work directly with those communities.
Current method is working fine.	Go to the people.
Door-to-door outreach to a sample of members communities of concern. Numerous meetings with non-profit and community organizations, especially park and community representative groups.	Hold outreach/input sessions live in the underserved communities. Maybe with free Covid vaccinations
Email and phone calls.	It is also essential that the County compensate and offer vouchers to folks in Communities of Concern for sharing their experiences as the County continues to gain public feedback.
Extremely transparent email updates	Phone calls to community members with short surveys
-Hire young people and people from traditionally marginalized communities	Provide a stipend for participant's time

-Outreach to schools! -Have an anonymous form for people to submit comments. Put it in your social media bios	
Involve all communities, Emerald Keepers in Coronado workshops and more; Let's involve local high schools too ; Outreach to teachers and schools for their involvement	Provide compensation for resident leaders who are sharing advice and time.
Meetings like this one and outreach to people without access to computers and smart phones	Small groups, in person, find existing groups
More focus groups, allow for the public to meet with individual County staffers	Social media and go to farms and work places
My experience/expertise involves EVs. Utilize people with experience.; 350.org seems to have an equity mission now.	Speak at schools when parents are there
Notice meetings, community outreach through events	The biggest barrier is a lack of information about how serious our climate emergency is. See if you can go into the schools to promote climate change literacy. That literacy is defined in the California Democratic Party Platform. You can get CAP input there.
Notify property owners for input	Use the CBO to reach out and faith Base Org.
Organize future workshops/workgroup meetings by topic areas instead of lumping all topics covered in the CAP update into one workshop	Webinars like this are a good start! I didn't really know what I was walking into, so maybe advertise what a webinar means when you ask people to go? It's not that intimidating, and I think if people knew then they would come. Once we get in person again—food! Provide attendees a yummy meal.
Present the CAP Update goals and possible solutions via community meetings, social media, and mailings....as seniors are not always on social media.	
Provide monetary compensation or vouchers to participants	
Reach out in all languages in our region; pay attention to grassroots environmental and social justice orgs	
Reach out to local environmental organizations like SD350 SDGNDA SDBEC and the like.	

Send us draft proposals and incorporate feedback. Reach out to stakeholders	
Small group discussions	
Support SANDAG Regional Transportation Plan and reach out to EPIC	
Volunteer opportunities, engage community, individual input	

6. **Cultural Nuances**
   Accessibility across language barriers and without jargon was emphasized in these responses. Additionally, responders noted that framing the information impacts how it is received, and suggested tying CAP Update information to people's daily lives and the potential for economic development instead of traditional "green" and environmental reasons.

What cultural nuances should the County take into consideration during the CAP Update? / ¿Qué matices culturales debe tener en cuenta el Condado durante la Actualización del CAP?
Providing materials in different languages
Visual material that can be interpreted by various languages is important
ACCESSIBLE language! No jargon!
Ensure that the process is easy understood by anyone and everyone by using phrases and wording that will be understood by everyone.
Interpretation
Involve leaders in communities of concern and building of affordable housing
People of other cultures, or who do not speak English, may be extremely shy but have great input/ideas
Have goals that folks can tie to their everyday life and improve their quality of life
Consider the jargon the County is using when giving presentations, because many people are easily confused by the specifics of climate science
Educate communities in their languages about the adverse health effects of climate change.
Do not rely on emails, social media, Internet to reach communities
Language outreach in other than English
Avoid jargon, but do not speak down to communities
We gave not been given the facts about climate change. Culturally we are ignorant because our institutions (faith based, educational, political, and so on) have failed to teach the truth about climate change.
We do not understand that failure will end our habitat, meaning we will starve.
Not all ESL speakers speak Spanish
Burning of fossil fuels is a big part of some cultures of sorts. We may need education in this area
Tribal cultures
Latinx and BIPOC
There is not always a trust in government outreach…and some residents do not believe their input will make a difference. County needs to demonstrate in some tangible way that there is trust and respect.

Communities of concern are always the most affected by climate change issues and worst affected by pollution.
Uniqueness of each
Generational differences! Gen Z, Millennials, and older generations will read and access this plan in totally different ways
Consider stepping outside the "green" framing. There are other things that the CAP will address that might be more important to people
Understand that not everyone sees things the same way. Recognize property owners' perspective may be very different than the tenants or renters. Both are important and relevant.
Continue to reach out to different cultures because they may have different issues.
Attitudes toward work, housing, and transportation may differ.
Make available in several languages, engage with Port communities especially and rural communities affected by wildfires and drought
Add social media outreach!!!!
Sea level rise should be a big part of it, too as people understand that and share the beaches

7. **Unincorporated County Underserved Community Locations**
   Participants identified communities along the border, East County, Backcountry, rural/agricultural areas, and tribal lands as places that require special attention in CAP Update efforts.

Where are there underserved communities in the unincorporated area of San Diego county that you believe require special attention? / ¿Hay alguna comunidad desatendida en la zona no incorporada del Condado de San Diego que requiera atención especial?
Spring Valley
Farm workers, workers serving residential areas or wealthier communities
Any areas along the border; Spring Valley; Communities living along freeways in unincorporated areas
Refer to CAL Enviro screen. Study Chula Vista's Climate Equity Index. Involve indigenous leaders
East/Back country, border communities; areas classified as food deserts. those far from accessible open space and public transit (trolley)
I represent disadvantaged communities in North County. North and east of Escondido, San Marcos; in and around the tribal lands; including but not limited to tribal communities; primarily Spanish speaking; Reach out via the National Latino Research Center, and Podar Popular
All those living close to freeways, suffering from air pollution.
All affected by Public Safety Power Shutoffs
East County has very poor areas
Reservations; every community with below average income
Ramona has underserved and underrepresented residents.... qualifying for "Disadvantaged Community" status under AB 1550 and the California Healthy Places Index. Approximately 25% of Ramona residents speak a language other than English.
Any that are considered communities of concern.

They are threaded throughout San Diego. South County in particular but there are areas near industry all over.
Tribal areas, east county
East County, rural areas. Places with a high concentration of people in a small area.
Spring Valley, Casa de Oro
Backcountry, reservations
Border, rural and tribal areas need to have input and attention especially regarding wildfires; Need electric car chargers in those areas as well (subsidized) to help the change to EVs

8. **Biggest Concern for Underserved Communities**
   Air quality, transportation, and affordable housing were listed by multiple participants as the most important concern for underserved communities. Additionally, structural issues such as communities' ability to participate in the process, the involvement of community leaders, and socio-economic disenfranchisement were noted as concerns.

If you had to choose the most important concern for underserved communities, what would it be? / Si tuviera que elegir la preocupación más importante de las comunidades desatendidas, ¿cuál sería esa preocupación?
Access to a variety of mobile/transportation options + affordable housing + wildfire safety
Air quality, transit accessibility; Cooling centers. ; High end development, displacement ; Subsidized solar for lower income households and rental properties.
How funding is being used and why underserved communities are not prioritized.
Air quality from cumulative impacts of pollution from diesel trucks, polluting industries; quality green spaces like parks, community resiliency hubs and more trees or community gardens; Prevent displacement from climate investments causing rising housing costs
Ensure that it's a community-driven process where the issues and solutions are identified by the communities themselves because they're the experts in what they need
We need to involve leaders. Air quality Transportation Build microgrids investment in communities of concern
Access to quality public transit (extend the trolley), access to quality affordable housing, access to green/open spaces, access to clean water and healthy food; end gentrification and high end/luxury housing developments. build affordable housing/infill development
Allocation to resources and education ; rebate programs so that communities of concern aren't left behind as we mitigate the climate crisis
Socio-economic disenfranchisement - Communities of Concern have been left out of the economic equation that empowers people to control their environment. That's why we live in "underserved" communities.
Prioritizing all emissions reduction investments in communities of concern.
Air Quality
Air quality
Air quality
Wildfire threat; heat illnesses; transportation access
The concern is that a bad CAP contributes to ending humanities habitat, which will first be experienced as soaring prices for food. Underserved communities will be the first to not be able to afford to eat. ; The most important concern is that a bad CAP contributes to ending

humanity's habitat, which will first be experienced as soaring prices for food. Underserved communities will be the first to not be able to afford to eat.
Wildfire smoke
Ability to voice the problems they are facing and have it adequately addressed
Air quality
Providing microgrids and VPPS and use BTM energy to increase family wealth
Exposure to unhealthy environment via air pollution through locations near high traffic areas and via power shut offs during heat waves/wildfire - forcing residents to open their windows for air circulation and to cool.
Air and water quality
Clean air, water and available food. No way you can disconnect these.
Access to public resources (water, energy, transit, housing, crisis response infrastructure)
Affordable housing, good public transportation, access to food stores in the area.
Affordable housing
Access to cool areas during heat wave; do not overburden those communities relative to other communities with solutions to GHG reduction
Air quality

9. **CAP Update and Its Policies to Assist Underserved Communities**
   Participants noted that investing in communities through job creation, infrastructure / green space, and easy-to-follow subsidies / rebate programs. Aggressive GHG reduction targets, like clean energy and affordable infill housing, were also noted as ways to assist underserved communities because of the environmental benefits in which it will result.

How can the CAP Update and its policies assist underserved communities? / ¿Cómo pueden la Actualización del CAP y sus políticas ayudar a las comunidades desatendidas?
Provide just transitions for people in unincorporated + underserved communities.
Ensure benefits and burdens are equitably distributed
Increase access to safe places for walking, biking, and recreation
Subsidizing rooftop solar for Lower income households, access to electric vehicles. Encourage infill development closer to jobs and transit.; Help provide accessibility to outdoor recreation opportunities, outdoor programs for disadvantaged communities to enjoy the natural resources of the county (transportation, promotion, support).
Use “San Diego Green New Deal CAP” sent to the City of SD as a guide. ; Create an anti-displacement strategy to ensure that members from these communities enjoy the infrastructure and housing they have fought for in their communities and are not displaced.
Prioritize investments in Environmental Justice communities first; Create more green spaces, electrify transportation
Make clear directives that are legally binding and implemented. Subsidies for communities of concern
invest in creating clean jobs in/for these communities. ; policies that dismantle "dirty" infrastructure and build "green" infrastructure, with a priority of the most

disenfranchised/polluted ;hold county contractors accountable to help achieve the goals in the CAP
Create a robust and tangible County Housing Element
By ensuring that economic development and economic empowerment are prioritized in communities of concern.
Understand what the communities need and invest
Programs to continue to educate on climate change; rebate programs to encourage environmentally-friendly changes in the home (perhaps work with the local utilities to create these programs)
Provide job training for high-paying green jobs; Reach out to those communities for their input. Many here submitting suggestions are not from underserved communities.
Aggressively reduce GHG production; recognize the land use linkage to inequity and GHG production, i.e. reduce VMTs
Achieving climate-stabilizing targets will end most use of fossil fuel causing more healthy living and adding a lot of green jobs
Desalinization to provide affordable water
Develop a comprehensive set of mitigation policies to assist everyone. Be aggressive in taking action
Ensure a stable energy source so residents are not exposed to air pollution during heat waves, wildfire, and location near busy roads. Understand that many underserved communities have residents that must travel to the jobsite bringing tools and materials. Provide a way to allow people their livelihood when making policy changes.
Have legally binding targets and prioritize funding for communities of concern.
Change direction from allowing polluting industries anywhere
Make sure that solutions are distributed equitably (rebates, incentives, investments, infrastructure), and fix existing problems with equity and level of potential future concern in mind.; Make it easy for people to get investments and rebates. It's confusing to have to fill out a bunch of applications.
Provide subsidies for upgrades that community cannot afford but need and will bring greater productivity and reduce health issues.
Provide tangible solutions for air quality and transportation, invest in green jobs for these communities hiring locally
Encourage infill, village-oriented development where housing is most affordable, closer to urban areas, amenities to reduce the transportation cost burden of lower income households who spend disproportionately for transportation.

10. **Remove Barriers to Participation**
    Being present in communities was noted as a major solution to remove barriers to participation. Many responders mentioned the importance of language accessibility and meeting day / time accessibility. Additionally, some participants discussed the lack of climate literacy in the community and suggested going to schools and community groups to inform more people about the climate crisis.

How can the County remove barriers so that everyone can participate? / ¿Cómo puede el Condado eliminar las barreras para que todos puedan participar?
Provide child-care during in-person meetings.
Hire people to do organizing for the outreach directly to community members.

Reach out to local community groups outside of the environmental space, such as Kiwanis or Rotary, because this might be the only type of organized groups in some communities. Work with County libraries to hold workshops and meetings there.
Hire community leaders to speak at schools and libraries
hold meetings at various times (weekends, weekday mornings, etc.). have community leaders facilitate discussions (in person), as there can be a barrier of language or literacy.
You have to go out, not expect them (us) to come to you. Timing is crucial. Provide incentives - financial and other. Leave the arrogance at home.
Outreach in Spanish, Tagalog, Arabic;
The biggest barrier is a lack of information about how serious our climate emergency is. See if you can go into the schools to promote climate change literacy. That literacy is defined in the California Democratic Party Platform. You can get CAP input there.
speak at schools when parents are there during night meetings
Accessibility for people with special needs (hearing, vision, learning, etc)
invite small group input
Barriers to stable technology impact participation in rural areas. Small, focused community meetings.
Collaborate with neighborhood groups.
Go out into the community.
More kinds of communication strategies—social media, infographics, short sentences
Ensuring that everyone is aware. Reach out to community groups including local churches and religious.
A small incentive may be a good method to reach folks.
These meetings are a start, but involve more outreach and locations in person when possible
Go to worksites, farms and other areas where immigrant labor is used.

11. **Anything Else?**
    Participants again called for bold action in CAP Update measure development and inclusive, robust outreach efforts.

What else should the County take into consideration during the CAP Update process? / ¿Hay algo más que el Condado debe considerar como parte de la Actualización de CAP?
That there is a lot of other big projects currently going on. SANDAG RTP, City of SD Budget etc. so residents are currently being spread thin an expected to be available. Compensating residents for their experience is essential. Also showing how resident input is being integrated.
Relationship building with community members takes time. Community members are the experts for their own solutions. Listen and build trust to work together
Follow climate science and hire experts like EPIC and involve students
Be bold and aggressive; prioritize climate and social impacts. Empower the historically disenfranchised ;solar powered everything, community power.; dismantle the bureaucracy. just get it done
The ongoing impact of white supremacy, patriarchy and other -isms in all of the institutions in San Diego.; I am deeply offended that you did not finish reading my statement on white

supremacy!! ; You skipped over WHITE SUPREMACY twice!! Please explain.
The county needs to work very closely with incorporated cities and community groups. As well as the various military commands here in the County
Join a CCA; Include electrification of new building development.
Incorporate Zero Waste principles, such as the circular economy
The link between GHG/VMT production, and land use patterns. The County has a key role here
A CAP must be a plan to achieve climate stabilization with a set of enforceable measures.; The best way to decrease VMT is with pricing systems. We must improve the way we pay to use parking and roads.; Since cars are the category that emits the most you must have a plan to show how cars will achieve climate-stabilizing targets.
Given decades of disinformation by Exxon, etc. not everyone will be happy about any plan.; the drawdown project may have useful videos, etc.; I think too much focus on reduced VMT is wrong. If we have EVs instead of ICEVs this becomes mistaken policy.
Climate change/ sustainability career opportunities!
Research from academia. Be bold!
That CAP Update solutions sometimes negatively impact unincorporated areas while benefitting urban areas... solar panels should be on every roof in urban/suburban areas before putting solar farms in scenic backcountry locations. Same with wind turbines.... major, negative impact for the area "hosting" the turbine - without the benefit. Rural areas have their power turned off first.... while more populated areas enjoy closed windows/air conditioning... This is a health consideration.
Must align with state federal and global GHG reduction targets.
How important our habitat lands play in controlling climate change.; Data.
Remember to get advice from young people. They're the ones that this is for! You are all doing an awesome job with this huge undertaking. Thank you for your work! Include a history about race, space, and place
Keep it simple and easy to understand. Be patient and really listen. Ask questions.
Reach out to the experts that understand the climate changes in San Diego
Calculate location accessibility and transportation burden not just housing affordability. Need to look at location accessibility which is a combination of housing costs + transportation costs which are a major burden on lower income households. Affordable housing that is affordable not just in the cost of the housing but in the cost of transportation.; Climate change information workshops to help lay out the clear science behind climate change to explain to people why this is important. There is a serious lack of climate literacy and building industry / oil industry spread much disinformation.

CAP Update Workshop – Smart Growth Alternative

Workshop Poll and Q&A Summary

This document provides a summary of responses from the live interactive poll questions and combines topics from the Q&A portion of the meeting, which was held June 30, 2021, at 6:00.

What is your understanding of a CEQA Alternative? / ¿Qué grado de comprensión tiene usted sobre una alternativa al CEQA?
Understanding of CEQA Alternatives was evenly split between the 12 participants who responded to this question.

Level of CEQA Alternative Understanding	Number of Responders
Not at all	4
Somewhat	4
High	4
Very High	4

What are areas in the unincorporated county that you consider Smart Growth? / ¿Cuáles son las áreas del condado no incorporado que usted considera áreas de Crecimiento Inteligente?

Responders noted specific areas within the county, including east, south, north, and county island. Additionally, responders noted characteristics of areas they consider Smart Growth, like proximity to transit, away from wildfire risk, and in village cores where infill density can be increased.

Specific Communities
4S Ranch
Borrego Springs
Bostonia
Casa de Oro
Ramona
Rancho San Diego
San Marcos
Sweetwater
General Characteristics
Amenable terrain (not steep slopes because construction emissions)
Close to existing and planned transit
Aligned with SANDAG's regional plan
Close to job centers
There are no unincorporated areas that are "smart"
Where infill/higher density is possible
Away from wildfire hazard areas
Village urban core to protect sprawl into agricultural lands
What about the need for housing in rural/agricultural areas?

What incentives would you propose to encourage growth in Smart Growth areas? / ¿Qué incentivos propondría para fomentar el crecimiento en áreas de Crecimiento Inteligente?

Proposed incentives included the areas of the built environment, CEQA and compliance, transportation, and monetary incentives. Multi-family units and increased density was a main suggestion and streamlining permitting and CEQA compliance was mentioned multiple times as well. Financing options and tax incentives were suggested as monetary incentives to encourage growth in Smart Growth areas.

Built Environment
Multi-Family Units
Allow higher densities in smart growth areas.
Allow more multi-family units (build higher/in fill)
Require developers to get proof of private fire insurance BEFORE getting permit to build
multi use lots with 15% affordable housing in single family and commercial lots
Cost/fee reduction for low/mod income/senior housing/multi-family.
Remove restrictions on multi-family housing
Support addition of agricultural housing in rural areas
increase height limit in smart growth areas.
Allow accessory dwelling units (ADUs)
CEQA/Compliance
CEQA compliance would be easier in these areas....
Expedited and streamlined CEQA processing.
Streamlining approvals and permits
Programmatic EIRs for community plan
Reduced VMT mitigation
Transportation
Smart growth in areas consistent w/SANDAG mobility hubs, provide incentives
No internal combustion engine vehicles allowed
Monetary Incentives
Tax incentives
Economic development
Help with managing flood engineering/plan costs
Financing
Other
Truly smart growth is not in unincorporated
Community microgrid solar/wind
Community garden/farm

What dis-incentives would you propose to encourage growth in Smart Growth areas? / ¿Qué desincentivos propondría para fomentar el crecimiento en áreas de Crecimiento Inteligente?

Proposed Smart Growth dis-incentives included the areas of CEQA and compliance, fees, the built environment, and agriculture and conservation. Inverse to Smart Growth incentives, dis-incentives included increased compliance and permit requirements and fees.

CEQA/Compliance
Thorough staff review of hazards and biology analysis in CEQA
OPR compliant SB 743 implementation.
Refuse permits
High VMT mitigation
Fees
Very very heavy added costs/fees as disincentive
Tighten regulations and add fees
Fees for fire suppression
VMT fee
Built Environment
Lifecycle rebuilding emissions analysis to meet carbon neutrality standards for next century.
Simply do not approve development which exceeds in any way original 2011 limitations
Make clear boundaries showing areas that aren't smart growth and refuse permits or create really steep regs tied to water/land use
Study the real association of land value for raw land to theoretical density. Did the properties down zoned in 2011 lose value and if so, how much? There should be enough land sales before 1998 when the plan started, 2011 when it was adopted, and now.
Agriculture & Conservation
Farm owners should be connected to potential buyers or leases who will continue to farm the land; Ensure quota of available water for regional agricultural use
Water limits
Other
Require educational program participation about issues/risks.

This document provides a summary of polling question responses and comments from participants captured at the Climate Action Plan Update (CAP Update) workshop held on July 28, 2021. This workshop was dedicated to measure development for the emissions reductions sectors of Energy, Water & Wastewater, and Solid Waste. All poll responses and written comments are available on the CAP Update website.

Energy

Measure Development Considerations

What should be considered for the energy sector to achieve a net-zero emissions future?

Built Environment
Equitable access to Electric Vehicle (EV) infrastructure in homes (rural, multi-family) and public spaces
Building electrification & efficiency: retrofits, embodied carbon targets
Supply water from local sources
Better public transportation
Ban synthetic turf, crumb rubber infill, pour in place playground mats
Recognize the GHG generation and VMT associated with General Services ground operations at all eight County of San Diego operated AIRPORTS.

Energy Sources
Equitable solar & renewables capacity – photovoltaic (PV) panels and battery storage
Community Choice Energy (CCE)
Phase out natural gas and fossil fuels
Renewable energy subsidies

Policies and Enforcement
Carbon tax on industries
Telecommuting policies
All electric reach codes

Solid Waste
Reduce product packaging
Compost to reduce landfill waste and emissions

What should NOT be considered for the energy sector?

Gas
Extending existing gas infrastructure
New natural gas infrastructure
Hydrogen or “renewable natural gas,” biogas, “green hydrogen”

Built Environment & Transportation
Private vehicle roads

Gas in the transportation sector
Urban sprawl

Renewable Energy Strategy
Depending on solar/wind energy in someone else's backyard
Roofs that are not optimized for solar panels
Carbon offsets

Is there anything else that should be considered for the energy sector?

Renewable Energy
Join a CCE
Consider the lack of solar PV recycling programs
Subsidize solar PV and electric cars, and conversion from propane / natural gas

Built Environment & Transportation
High density communities with work and recreation opportunities
Increased tree canopy to help reduce energy use, mitigate heat island effect, improve air quality
Chemicals of concern in electrification

Timeline
2050 is too late
What happens after 2050? Plan to at least 2100. Carbon sequestration should last at least 100 yrs
Vision for a climate positive future

Other
Consider energy used in agriculture
Protect open space as a carbon offset; manage natural resources
Outlaw offshore drilling

Energy & Equity

How can equity be considered for the energy sector, while still achieving net-zero emissions?

Equitable Services & Green Jobs
Create clean energy / green jobs in rural and low-income areas
Implement green jobs training programs

Ensure transmission infrastructure planning does not exacerbate environmental justice (EJ) communities
Subsidize or provide grants for rooftop solar PV for low-income communities
Prioritize retrofits in disadvantaged and high pollution areas
Increase public transportation, especially in rural and low-income areas
Do not depend on rural or low-income areas to shoulder the bulk of wind and solar development – "Solar Yimbyism"
Rate assistance

Community Energy
CCE is a key equity program; San Diego Community Power is leading on this regionally
Community micro-grids

Access to Clean Resources
Access to clean air and clean energy
Separate clean water, wastewater, and stormwater by fixing leaks
Protect open space; create parks in communities of concern
Not just net zero, but improving communities

Outreach
Work and partner with communities of concern, community-based organizations (CBOs), and community leaders to see what they want and need

Water & Wastewater

Measure Development Considerations

What should be considered for the water & wastewater sector to achieve a net-zero emissions future?

Water Reuse & Recycling
Allow greywater for flushing toilets
Allow onsite greywater and blackwater treatment and reuse
Recycle wastewater
Facilitate rainwater capture and storage
Normalize toilet to tap

Water Pollution Reduction
Existing BMPs do not capture microplastics or the toxins and carcinogens they contain
Use storm drain systems that capture trash before it reaches water bodies
Do not allow permeable pavers or rubberized concrete because toxins, carcinogens, and high heat contribute to climate change
Prioritize fixing leaks so runoff is not contaminated with sewage or contaminate drinking water
Educate the public on BMPs for preventing pollution from rain and runoff

Water Use Reduction

Promote the Green Building Incentive program
Increase shade / tree cover to prevent drying
Explore opportunities to reduce water in the agricultural sector
Ban water intensive crops like almonds
Public outreach to use less water
Ban lawns
Lawns / unusable landscape should be banned

Aquifers
Remediate polluted aquifers to increase storage capacity
Increase permeability to refill aquifers; permeable pavement

Water Source
Providing exemptions to water restrictions
Source water locally
Consult with San Diego Regional Water Quality Control Board on energy use associated with water conveyance, capture and storage BMPs
Move away from water conveyance

What should NOT be considered for the water & wastewater sector to achieve a net-zero emissions future?

Water Source
Desalination
Importing water

Water Quality Considerations
Bioswales are only effective for certain chemical contaminants and are very costly
Using saline recycled water for landscaping because salts build up in hot weather
Dumping partially treated water into the ocean

Water Uses
Ever free drinking water for everyone
Lawns
Water intensive uses like golf courses, parks with lawns, greenways in development
Providing exemptions to water restrictions

Is there anything else that should be considered for the water & wastewater sector?

Water Conservation
Climate resilience – anticipate both extreme dry and wet conditions
Lawn tax

Keep innovating
Teach water conservation in all years, not just droughts
Treating water at different levels, i.e., greywater, blackwater.
Sinks for handwashing attached to toilet tanks so water is used for flushing

Equitable Water Access
Treat clean water access like a basic human right
Test water independently in all communities

Enforcement & Education
Enforce on water polluters
Help residents understand what the upper limits of water supply from county water districts are

Water, Wastewater, & Equity

How can equity be considered for the water and wastewater sector, while still achieving net-zero emissions?

Education & Outreach
Conduct school tours of waste and water reclamation facilities
Educate students and public to reduce water use
Do not expect people working 3 jobs to also be able to advocate for themselves
Work, listen, and empower rather than “educate”
Incentivize participation in community outreach
Consider access when planning information dissemination, sessions, classes – not everyone has internet at home or can attend at a certain time

Equitable Services
Provide increased County maintenance and infrastructure management in low-income and under-represented communities
Retrofit old buildings and homes in low-income areas to be water efficient
Replace lead pipes
Ensure that water quality in each area doesn’t correlate with income level and other indicators
Work with people in low-income communities that are prone to flooding
Subsidize water leak repair
Reward those who use less water / don’t have lawns, tax those who use more than their fair share, e.g., golf courses

Solid Waste

Measure Development Considerations

What should be considered for the solid waste sector to achieve a net-zero emissions future?

Waste Stream Management – At Home

Access to public waste bins that allow properly separated waste
Free at-home compost bins and program
Penalties for organic waste in the trash

Waste Stream Management – Commercial
Every company should have compost recycling
More stringent laws for construction waste management
Encourage/incentivize recycling companies, waste management in general
Innovate on plastic recycling
Have a zero-waste plan
Streamline permitting of recycling infrastructure

Landfills
Landfill gas capture grids always break down as garbage decomposes. Start planning for the next generation of landfill gas capture systems now.
Keep mining methane like in the Miramar landfill.

Education
Educate on zero waste and reduce, reuse, recycle
Educate the public about what landfills emit. That gas is more than just methane, and burning it produces more than CO_2

Producers & Materials
Top synthetic turf as it creates tons of waste
Extended producer responsibility (EPR) legislation, product ban
Ban single-use plastics and Styrofoam
Reduce packaging

What should NOT be considered for the solid waste sector to achieve a net-zero emissions future?

Public Health and Safety; Compliance
Careless universal composting should not be considered because many pests and pathogens can pass through compost
Synthetic turf contains toxins and should be considered hazardous waste
Ensure proper waste disposal and recycling streams by residents
Overly punitive measures discourage cooperation

Producers & Materials
Materials that do not biodegrade quickly
Synthetic turf is plastic, not recyclable, and can off gas methane and ethylene
"Closure turf" on landfills
Eliminate full commingled recycling

Impose stringent laws on red list materials or chemicals of concern in materials as they are harder to recycle and pose hazards throughout life cycle

Landfills
Landfill expansion
Permitting of new landfills when there is sufficient disposal capacity

Education
Provide County-wide metrics on solid waste
Educate on lifecycle management of products

Is there anything else that should be considered for the solid waste sector?

Organic Materials & Food
Incentivize community composting sites at community gardens
Prioritize food recovery

Producers & Materials
Extended Producer Responsibility
Product bans
Promote sharing economy instead of consumerism and disposal

Natural & Built Environments
Increase incentives for adaptive reuse of existing buildings to avoid unnecessary construction waste
Recycle concrete
Native plants on landfill landscaping – a specialized field, learn from counties that currently do this
Increase incentives for recycling and material harvesting from building and construction waste

Other
Education, education, education!
Establish a needs assessment requirement before addition of landfill disposal capacity and/or consideration of new landfills

Solid Waste & Equity

How can equity be considered for the solid waste sector, while still achieving net-zero emissions?

Curbside & At Home
Provide segregated recycling bins in all communities

Provide free composting bins
While curbside composting is now available in some cities in the county, the information and education piece needs to continue

Community Wide
Stop dumping trash and pollution in low-income communities
Preclude siting of new landfills in already environmentally burdened communities
Incentivize community composting sites at community gardens
Require waste haulers to provide all services in rural areas
Safely close existing waste sites
Stop building sprawl developments near landfills, like Santee, Otay
Compost giveaways and other ways to give back to the community for their efforts
Better education on proper recycling
Provide native plant seed free of charge

Economic Factors
Jobs, jobs, jobs!
Start sanitation engineering degree and certificate programs at local universities

Built Environment & Transportation

The Climate Action Plan Update (CAP Update) project team held a virtual workshop on August 25, 2021, to solicit feedback on development of emissions reduction measures related to the built environment and transportation sector. 34 stakeholders participated in this workshop by answering five poll questions and asking 26 questions via the Q&A feature on Zoom. Poll questions covered measure development considerations, equity considerations, and solicited any other considerations or ideas not yet covered. Major themes identified by participants included stopping urban sprawl, providing equitable public transit, increasing electric vehicles (EVs) and EV infrastructure, and incentivizing green building practices. The summary below takes a closer look at each poll question presented and specific questions posed by participants.

Measure Development Considerations

What should be considered for the built environment/ transportation sector to achieve a net-zero emissions future?

Land Use
No sprawl land use development
Infill development
Zoning to allow dense developments with both commercial and residential buildings together
Preserve open spaces
Preserve vegetation & trees in residential areas – don't defoliate with infill
Build homes near transit
Urban parkland
Reforestation
Create free or minimal cost public co-working spaces

Transportation Infrastructure
Slow streets
Active transportation: bike and pedestrian infrastructure
Bike storage near transit
Traffic calming
Charging stations for electric vehicles (EVs) and bikes
Create zero emissions vehicle (ZEV) only zones or roads

EVs and EV Infrastructure
More EV charging stations
Electrify school buses
Green/electrify the County fleet
Affordable EV programs with car dealers for all income levels
Increase electricity storage to support EVs
Self-driving EVs, especially for seniors

Buildings

Building electrification
All-electric new homes
Electric building retrofits for County facilities
Incentivize home & business retrofits: replace old, inefficient appliances, install electric heat pump systems for heating, cooling, and water heating
All electric building reach codes
Require e-bike charging outlets at work and businesses
Building codes that require EV charging-ready homes
Use less carbon-intensive building materials and require deconstruction

Energy
Micro grids
Incentivize solar photovoltaic (PV)

Transit
Expand remote area public transportation
No-cost transit passes for people 24 and younger
Increased frequency of public transportation to encourage mode shift
Transit proximity to residential areas
Offer incentives to use public transportation
Free door to door transport for disabled people
Solve last mile problem – can't use transit if it doesn't go where one needs to go

Other Considerations
More telecommuting & work from home
Senate Bill (SB) 743 implementation aligned with state guidance
Provide composting waste management
Involve Federal and Tribal organizations in the CAP Update
Increase gas taxes over time

What should NOT be considered for the built environment/ transportation sector?

Land Use
Do NOT allow sprawl development
Do not encourage development by more freeways
No Harvest Hills development
Do not allow residential developments away from business districts and job centers
Do not allow new housing in wildfire zones
Do not remove urban tree canopy or defoliate established residential neighborhoods

Transportation
Slow the streets – stop setting the speed limits with the average speed
No more expanding existing roads/freeways or building new roads/freeways

No new gas stations
No more noise polluting transportation; cars and trolley can be very loud
Do not apply vehicle miles traveled (VMT) reductions to EVs
The County's VMT significance threshold MUST be based on a combined whole-region average, NOT an unincorporated-trips average
County fleet should NOT include any new fossil fuel vehicles

Policies and Incentives & Disincentives
Do not violate the SB 743 implementation
No tax breaks for corporations and large businesses
Do not incentivize more development in low density areas
Do not increase costs on people of lower means
Do not propose anything that does not have an understanding of costs and benefits
Ban leaf blowers instead of switching them to high noise electric. Leaf blowers still kick up dust for air pollution and serve little to no purpose
Stop allowing gas generators which are allowed to pollute during emergencies, which will only increase with the climate problem
Stop feeding the Urban Growth Machine -- recognize that we are nearing human population carrying capacity in the county
No new gas infrastructure

Equity Considerations

How can equity be considered for the built environment/transportation sector, while still achieving net-zero emissions?

Housing
Provide affordable housing ONLY in urbanized communities
LOTS of e-charging stations in rental housing
Inclusionary housing policy to provide 20-25% affordable housing in every housing development
Subsidize solar panels for rental housing
Create a County program to help get solar on multifamily affordable housing (SOMAH) installed on more roofs
Build more mixed income housing projects
Provide incentives to landlords and apartment complexes to install solar and pass savings to renters
Past sprawl development has sucked investment, public dollars and private, from existing communities esp. those with inequity. Ending sprawl will allow re-investment in existing communities, esp. disadvantaged

Transportation
Affordable public transportation for disadvantaged communities
Prioritize sustainable transportation investments in low-income communities and communities of color.

EV use/purchase incentives based on income
Make public transportation cheap as possible

Quality of Life & Public Health
Prioritize changes for communities of concern and low-income neighborhoods – what is done in affluent areas should be standard across the county
High-speed internet in disadvantaged communities
Increased tree canopy in disadvantaged communities
Ensure open space/park access in all residential areas
Ensure access to college
Provide opportunities to thrive
Install more air quality monitors, including ozone
Enhance air quality/filtration
Use air quality to determine where to adopt new measures to help reduce emissions
Those who live in far rural areas should not be penalized for longer mileages to services

Buildings & Energy
More EV charging stations
Building Electrification for all new construction
Incentivize solar
Ask SDG&E to close peaker plants and replace with solar roof tops and battery storage

Outreach & Engagement
Engage disadvantaged communities
Increase youth opportunity
Effective communication and education on new policies, encouraging feedback from communities
Use language that is easy to understand during discussions and in policies
Consistently engage communities identified in the Environmental Justice Element throughout the sustainable transportation investment process

Equitable Policies & Practices
If we have carbon taxes to disincentivize a move away from fossil fuels, make sure that they are collected in a way that includes income as a means of determining the tax--or give rebates to lower income people
Incentivize businesses taking responsibility for the pollution they create
Have equity champions involved in CAP
Use CalEnviroScreen
We have to make sure that the plans are not so odious that there is a political backlash
Seek funding available from state and federal government to address equity issues
Learn from other organizations on what they are doing about equity and other greenhouse issues

Other Considerations

Is there anything else that should be considered for the built environment/ transportation sector?

CAP Update Development Process
In measuring GHGs from development and transportation, it will be vital to be as accurate and honest as possible
Make sure there is consistency among all CAPs in the San Diego region
Stick to the principle and don't create any loopholes
I appreciate the Regional Climate Plan – let's make sure the CAP is very ambitious. Science keeps exposing that we're underestimating the need for quick change
Encourage the cultural shift that will be needed
Make sure that the supporting activities are being promoted so that our plan can work. For example, reducing the cost of goal electrical storage could be key to providing the extra electricity needed. How can we advocate for that research?
Design to assist behavioral changes among residents

Outreach, Education, Collaboration
Educate San Diegans about Climate Change, its Impacts, and what they should and should not do
Outreach to educate about pre-apprenticeship and apprenticeship opportunities so we can have enough trades people to build everything everyone is suggest we build. Pull for Project Labor Agreements (PLA) which have languished for the skilled and trained, and local hire
Cycling needs ambassadors and outreach to create real mode shift. Let's provide models for people to see the change.
Please consider utilizing polls like this on social media platforms to ask one or two questions.
Work with all cities to see where they are and how to pool resources
Safety courses for these newer options
Engage "disadvantaged" youth and all youth. They will be inheriting our "solutions"
Persistent PSAs regarding best behavior for climate

Land Use
Land development within urbanized areas is better than on urban edges, and much better than more sprawl
The parallel Regional Decarbonization Plan effort provides the opportunity to be as land efficient as possible
Evaluate and implement methods to increase use of density bonus program in transit-oriented development (TOD) development projects located in urbanized county communities

Transportation
On-demand after hour public transportation options
Subsidizing rideshares for the last mile
Stop/disincentivize high-VMT sprawl
Last mile (destination end) problem is the difficult one. This is where density belongs. First mile problem is trivial to solve with park-and-ride, bike-and-ride, etc. from home.
Banning ICE vehicles from many places, including express lanes would greatly accelerate the necessary adoption

reduce airport use until we have clean aircraft

Infrastructure – EV & General
Streetlights and other safety measures for pedestrians who are walking to and from transit stations or bus stops
Power desalination and water reclamation plants with renewable energy
Tesla has fast-charge rescue trucks for EV drivers who run out of range. I suppose EV charging facilities will become more common on tow trucks, for "just enough charge to get to the next charging station." Otherwise, EVs just get towed to a charging station.
Emergency charging vehicles can carry batteries to provide charging for EV drivers who run out of charge (which is very rare since the remaining battery life is very accurate)

Agriculture & Conservation

The Climate Action Plan Update (CAP Update) project team held a virtual workshop on September 29, 2021, to solicit feedback on development of greenhouse gas (GHG) emissions reduction measures related to the agriculture & conservation sector. 53 stakeholders participated in this workshop by answering five poll questions and asking 21 questions via the Q&A feature on Zoom. Poll questions covered measure development considerations, equity considerations, and solicited any other considerations or ideas not yet covered.

Major themes identified by participants included organic and regenerative farming, water-wise solutions, carbon sequestration, learning from indigenous peoples, preserving agricultural and open space, and incentivizing sustainable agricultural practices. Additionally, participants stressed the importance of aggressive emissions reductions targets, especially as they relate to equity, because frontline communities will be the first and worst hit by climate change impacts. The tables below take a closer look at each poll question presented and specific responses from participants.

Measure Development Considerations

What should be considered for the agriculture & conservation sector to achieve a net-zero emissions future?

Carbon Farming / Sequestration & Composting
Provide funds for pilot projects to adapt carbon farming strategies to our bioregion
Farmer network to share carbon farming information
Add and options to the Purchase of Agricultural Conservation Easement (PACE) program that further incentivize carbon sequestration on agricultural easements
Incentivize urban food forests with carbon sequestering fruit and nut trees
Nurseries are the hugest industry by far, but carbon farming largely doesn't apply to them - address carbon sequestration and renewable energy in nurseries and floriculture
Quantify the carbon sequestered through new applications of carbon farming techniques and apply that to the CAP's GHG reduction target
Only allow pastured cattle, which sequesters carbon
New farmer training programs that teach carbon farming
Reduce loss of our carbon sequestering orchards by making water more affordable
Create an incentive program to provide grant dollars to farmers who want to implement more carbon farming techniques, such as compost application or use of cover crops
Increasing carbon sequestration practices in nurseries
Consider incentivizing carbon-farming practices (Ex: no till, cover crops, and compost applications in area farms and ranches)
Quantify carbon sequestered as a new application of carbon farming techniques
Incentivize farmers and ranchers to use carbon-farming practices like no-till, cover crops, and compost application
Incorporating county wide composting from all sectors would be necessary to support carbon sequestration
Incorporate nurseries into climate planning, as a huge part of the ag sector! carbon farming practices largely do not apply to them (not growing in soil)
Track agricultural conservation easements to ensure agriculture is still occurring to keep up the sequestration

County wide composting service
Partner with industries to increase compost and mulch use.
Community composting of all "spoiled" crops
Curbside organics to compost to farm
Compost/methane recapture
Permaculture
Mulch food waste for fertilizer
Reduction in food waste

Energy & Agriculture
Survey the market for electric farm machines and figure out if the County can speed things along
Biomass or biogenic plant or animal products, material such as clippings and mulch Can be utilized to create renewable natural gas. Farm equipment can be fuel through renewable natural gas such as our trash trucks and buses we have around the county and is clean
Replace ICE County vehicles with EVs
Buy back for gas farm and lawn equipment
Change programs for gas powered engines to electric or solar powered
More EV charging stations
EV farm equipment
Electrify landscaping equipment
Using EV farming equipment and mass transit with 1st and last mile options. Install more EV charging stations to promote more EV cars
Shut down methane production
Reducing energy usage in controlled environments (greenhouses)
Loan programs to assist growers to replace fossil fuel burning equipment with electric equipment
Study the effects of combining solar and wind energy production with row crops, pasture, and/or rangelands
Ban sales of ICE farm equipment
Electric agricultural vehicles
Biodiesel and waste to energy. Plants are biomass can be used to create electricity
More Electric vehicles
Utilize the manure for biofuel
Use cow waste as biofuel

Community Support and Local & Native Practices
Teach people how to eat the indigenous food
Restrict crops which are not indigenous or appropriate for the environment, such as almonds
Incentivize local markets to buy local ag vs. Shipping out externally
Keep ag LOCAL
Increase native tree plantings

Increase community/school gardening and farming opportunities, show people how to grow their own food indoors and outdoors
Support community gardens
It would be nice if the trees were fruit trees. Also, Community trees that are planted would be nice to be in Community Gardens throughout the cities and unincorporated parts of San Diego
More urban farming to reduce food to table time and distance
Develop an education and outreach program that promotes the adoption of healthier and low-emission diets in households, schools, and other institutions.
Land management to reduce wildfire risk, including cultural burning
Carpool/vanpool/etc. incentives for farm workers
Continue rebate program for equipment
Planting more trees in urban areas.
Tree planting
Plant trees
Plant more trees
Trees should be dual-purposes, just as chickens can be dual-purposes meat and eggs
Regenerative Agriculture, Organic Farming, and Small Farms
Regenerative agriculture
Allow only appropriate regenerative agriculture
Incentivize regenerative agriculture by compensating farmers for the climate resilience and mitigation services they provide
Regenerative agriculture practices including rotational grazing, cover crops and use of mulch so methane production is reduced, and carbon sequestration increased
Use horse manure with worms to create worm castings which are needed for organic farming
Organic farming
More incentives for organic farming
Stop using toxic synthetic pesticides and fertilizers on County leased lands. Toxic pesticides do not allow for healthy soils
Stop petroleum chemical-based farming
Stop pesticide use to increase soil health
Pollinator friendly gardens
Smaller farms that produce plants for food and have livestock
Consider aquafarming and its emission levels
Not sludge application on Ag land
Grey Water / Water Use
Enable grey water to be used for agricultural purposes and sold to farmers/ranchers at much lower prices than an acre-foot currently costs
Source water locally via grey/black water purification and stormwater capture systems
Capture rainwater in our landscapes, less stormwater being sent to the ocean
Use Gray water
Use grey water

Better incentives for homeowners to capture rainwater and recycle greywater for growing food and trees to sequester backyard carbon
Expand recycled water to all ag areas and make that water more affordable

Regulations & Incentives
Update building and zoning codes to support urban agriculture
Right to farm legislation to preserve farmland
Incentivize the ban/reduction of pesticides
Funds/incentives for the equipment necessary to implement practices
Incentivize urban food forests
Incentives for farming practices
Grant programs from the county - to upgrade equipment, purchase compost and mulch, etc.
We need a broad sweep of actions; we can't afford to focus on one or two
Utilizing an existing model of measurement such as Comet Planner

Other Considerations
Reduce sprawl by building in already devolved areas
Biodiesel can be used on current equipment
Green infrastructure using curb cuts and include bike lanes to have multiple benefits
Use seaweed in diet of cows
Land acquisition for conservation
Reduce population of beef and dairy cattle through encouraging more plant-based options

What should NOT be considered for the agriculture & conservation sector?

Approach
Stop considering conservation as being in opposition to agriculture
No offset credits
All of the above approach is necessary
A narrow focus on measures that address food-producing farms, without considering the huge role that nursery and floriculture plays in county ag
Pitting regenerative against conventional… We can all do better and be part of the solution

Compost
Horse stables could provide their manure for creating worm castings
Don't try to compost in a way that produces methane.
Worm castings

Fossil Fuels & Energy
I disagree that electrification will drive up costs if solar power is installed locally.
No more fossil fuels
No fossil fuel use
Stop diesel
Diesel

Electric farm equipment is far too expensive and not as durable or longer lasting for the local farmer
Farming and burning trees for energy (biomass)
An increase in using "natural gas" because it is methane, which is a GHG
Natural gas

Food
Imported foods until we can transport them with 0 emissions
Foods should be exported less
Electric equipment will drive up food cost

Labor
Worker exploitation
Corporate farming needs to be avoided
Big corporate farms
Factory farms
No factory farms

Land Use
Converting ag to housing
Land use change from native ecosystems to agriculture
Less urban sprawl to preserve agriculture and habitat

Pesticides & Synthetic Materials
Pesticides harming nearby communities and schools!
Stop all pesticide use on county lands…including lands leased for farming
Organic farming, discontinuing toxic pesticides and synthetic fertilizers.
Synthetic fertilizers and synthetic pesticides
End the use of glyphosate on county lands
No synthetic pesticides
Continued use of pesticides that are unhealthy
Plastics
No synthetic turf
Plastics, petrochemical products

Regulations
Regulations… keep carbon farming voluntary

Natural Environment
Any practice that harms soil health
Limit water-intensive trees like almonds

Equity Considerations

How can equity be considered for the agriculture & conservation sector, while still achieving net-zero emissions?

Training & Education
Training for non-toxic methods
Provide organic mentorship
Allow adequate time to comply with new regulations
Farmer to farmer mentorship
Provide free training on carbon farming techniques to current participants in community gardens
Educational outreach (PSAs?) about the value of keeping your trees instead of cutting them down or topping them
Address bipoc farmers' needs in rural areas, not just urban
Prioritize training for bipoc farmers
Hold a workshop about the effects of rodenticides.,
Hold a workshop about ideas and current legislation to protect pollinators.
Plant a tree workshops
Show visual examples at workshops of how trees and plants can be grown in cities
Host a collaboration between neighbors and farmers to discuss toxic pesticides used on county lands.
Community outreach on healthy environments and education on toxic chemicals
Regular, consistent outreach to communities
Provide a workshop showing toxic pesticides used on county lands
Equitable access to education for net zero learning opportunities
How healthy soils and plants clean the air
Provide County workshops for Permaculture and stopping synthetic pesticides and fertilizers
Educate residents on dangers of pesticides on healthy alternatives
More training and outreach opportunities.
Training programs in organic land management

Labor & Environmental Justice
Fair labor practices...prevent exploitation of farm workers...especially migrant workers
Address the rising numbers of hate groups in SDC
Quality farmworker housing
Look at farm worker housing incentives, reduce barriers in the zoning ordinance
Affordable rural housing
Use Trackingcalifornia.org. and EnviroScreen4.0 from OEHHA. North county San Diego is incredibly pesticide intensive compared to the rest of the state! this harms workers, the public, our food our water and our soil.
If we fail, then low-income folks will be the first to not be able to buy scarce food.
Using the CalEnviroScreening offer more outreach and training opportunities in those areas of most need.

The county should not lease land to any farms or businesses that have worker violations. (The county leases to West Coast tomatoes. They had worker violations in 2019.)
Consideration of the health impact to those who work to produce our food is paramount. Healthy air quality is not possible with unhealthy airborne chemicals. The health of our farm workers must be included in any plan.
If an important sector like Ag fails to conform to climate stabilization requirements, it will be contributing to mass starvation because that is part of what climate destabilization will look like. Low-income folks will be the first to not be able to buy scarce food.
Show how community voices are heard and implemented in policy
Climate destabilization is the opposite of equity. We can't fail.
No worker exploitation

Direct Assistance
Program for distribution of local farm products
Develop a program for homeless people to volunteer in community gardening projects
Providing organic foods for low-income communities/ families
Provide gardens and natural areas in underserved communities
Encourage grocers, etc. to buy from local farmers
Provide appropriate drought-resistant plants
Require support of local farmers' crops in larger grocery markets
Farmers markets
Offer targeted support to small farmers
Lift up farmers who have been early adopters.
Ensure food produced with carbon farming techniques is made available in urban neighborhoods through incentives to reduce the costs of joining a CSA or purchasing at a farmers' market
Help provide Organic Foods for all
Set up a program for collection of usable vegetables, etc. from markets that will otherwise be disposed of and distribute to disadvantaged communities.

Financing, Incentives, & Economic Considerations
Expense is number one. Utilize current equipment, change, and clean up the fuel.
Meet the farmers were their at most farmers can't afford new electrical equipment
Trade-in programs
Rebate/buy back programs for fossil fuel equipment
Financing and land access for bipoc farmers
Making farm startup and operation loans accessible to allow under-served groups to begin farming (Hispanic and Black San Diegans farm at much lower rates compared to population #, very few Hispanic farm owners despite huge participation of Hispanic farmworkers, few non-white farmers have family land to inherit)
Grants for farmers to provide directly to food banks
Grants to farmers to provide organic produce to grocery outlets in "food desert" communities
Incentives to move away from animal farming to growing crops.
Incentives for hiring and training people of lower income communities.

Extra incentives for carbon farmed food sold in communities of concern
Financial incentives need to account for historical inequities and poverty. They also need to be carefully crafted to maximize carbon sequestration while not leaving any farmers behind who would be otherwise interested.
Incentivize farms for people of color in urban areas
Provide incentives/subsidies
Some measures may need to be subsidized
Offer subsidies to convert from gas to electric motors
The County may have to subsidize what it requires. By the way, we do need ENFORCEABLE measures that will do its part to achieve climate stabilization
Can carbon emitting uses pay a fee that helps offset new ag technology that reduces GHG?
Reduce government fees, taxes, excess permit requirements in order to make organic farming possible to more farmers.

Access
Access to organic food should not be limited to the wealthy
Incorporate climate justice in farming Food accessibility
Equitable distribution of fresh food access
Translation of information
Equal access to organic food
Simplified participation guidelines

Community Gardens & Open Space
Develop areas in urban centers for community gardens
Expand community and urban gardens
Community gardens.
Lots of community gardens; programs to get them started and for more people to participate
Allow people to harvest local plants on public lands within reason: https://www.kqed.org/bayareabites/111808/the-wild-and-native-foods-we-should-be-eating
Local food farms/ more community gardens.
Allow more neighborhood gardens
Natural parks open green spaces
Equal access to green spaces… People in El Centro should have the same % of green spaces as La Jolla
Green spaces reduce heat in urban areas
How will community gardens feed the millions of San Diegans?
Community gardens will use more water than the existing farms

Water-Efficient Agricultural Practices
Encourage water wise crops
Plant only food-plants and trees
Encourage crops that can grow here with minimal resource use

Use drip systems to get more water for larger crops.
Discounted use of recycled water
Urban gardens. Smart water controllers, sprinklers. More rebates/incentives
Recycle water and water capture
Change crops to more native plant species and develop a market for these kinds of crops
Grow crops that require only water and nutrients in warehouses.

Other Sustainable Agricultural Practices
Ban use of harmful chemicals on crops, which helps to protect workers and everyone
Seasonal production
Enriched carbon soil creates bigger crops. Use carbon capture
Incorporate carbon capture and storage systems to further reduce CO_2 omissions. CO_2 in rich soil creates larger crop yields
Learn from natives, as these people have done, before the knowledge is lost: https://www.makamham.com/cafeohlone
Indigenous people in this County hold incredible knowledge. That knowledge should be respected in order to help all people no matter their race
Include an IPM as a part of the climate action plan.
No use of used tire crumb rubber or rubber mulch in residential or commercial, ag land
Having healthy environments for our communities/ banning toxic pesticides and using renewable energy
Grow crops on rooftops
Protect farmworkers from toxic pesticides

Energy
Animal waste can be converted into clean renewable natural gas
Endorse national carbon pricing with dividend
Waste to energy systems produces Energy. That same amount of material that would probably be buried in Landfills
MicroGrids
Utilize animal waste for renewable natural gas
Use of microgrids for power

Other Considerations

Is there anything else that should be considered for the agriculture & conservation sector?

Education
Support programs like Encinitas School District farm lab where kids have an organic salad option for lunch
Encinitas farm lab… schools grow their own organic produce
Incentives for youth to start farming… training and workshops
More information to youth about food that is delicious but uses less resources
Again. Create resource teachers to send to Community Schools to teach how to create Community Gardens and school Gardens. Also teach them how to use the food that they grow in these Gardens

Community service for youth at community gardens, composting centers, tree planting . . .
Training programs in schools re: organic land management
Youth education programs and volunteer farming projects
Lift up/publicize existing local models
Programs to get youth involved
Workshops and educational programs are needed for community members who want to be involved but don't have the knowledge
Education on connection between regenerative farming and climate resilience
Utilize local farmers in media relations to spread the word on implementing these measures (j. Mraz)

Aggressive Targets
The County should always state that we have a Code Red Climate Emergency. The IPCC is correct about that.
2045 is too late. 2035 May even be too late.
The 2030 requirement is 80% NOT 40%. Zero by 2045 is OK. But if we fail to achieve the 2030 target, we fail. The 2045 target won't matter.
Since climate destabilization is the opposite of equity, the County should NOT ASSUME that state mandates are enough. The 2030 requirement is 80% NOT 40%. Zero by 2045 is OK. But if we fail to achieve the 2030 target, we fail. The 2045 target won't matter.
State waste reduction goals boost our RNG development SB 1383 set comprehensive requirements for organic diversion and establishment of methane establish reduction targets

Sustainable Agricultural Practices & Compost
Have county facilities/contractors' source local food
Healthy organic foods, healthy soils, banning toxic pesticides, protecting our environment and people's health
No over spraying of pesticides (planes, helicopters)
Everyone's concerns regarding healthy environments and availability of healthy organic foods/ banning toxic chemicals and pesticides.
Organic IPM!
Human health before profits…no more pesticides!
Manure management must not add to air quality problems.
Crop imports such as avocados killed local groves as the imported crop prices ignored the externalized costs of fossil fuels used in transport, etc. A reason to limit imports.
Pollinator / butterfly sanctuaries
What uses are complimentary uses with AG? Wind farming?
Nurseries and floriculture! it's a huge sector but what we consider "carbon farming" doesn't often apply to those operations!
More olive oil
Look at crops for our climate…don't force crops that are hard to grow here
Make county hub for organic farming
The price of water is the biggest reason for loss of our sequestering tree crops. This has to be addressed in the long term if we are to conserve the soils and perennial crops that we do have.

Slo County sustainable wine trail is a good example, mapping out sustainable farms, making info easily accessible the buyer. LODI does this.
County wide compost and fertilizer programs
Making compost more available to farmers addresses food waste issues (SB 1383) while also supporting carbon farming (less fertilizer need, better water infiltration)
Move County compost regs (and policies like it) faster!!!
Some people (my relatives) object to collecting their food waste for collection with their green waste because of the smell. There is a method used by the Solana Center in Encinitas, the Bokashi method, which virtually eliminates the smell! Investigate it
Incentives & Policy
Incentives for farmers to install solar and battery storage for community micro grids
Keep an eye on carbon offset markets (e.g. Nori, Indigo Ag) where farmers can get paid for sequestering carbon in soil - can help inform quantification of local carbon farming benefits
Encourage restaurants to use local foods
Encourage more certified sustainable farming practices
Update zoning / building codes to support urban agriculture
Help good farms to transport their food to other neighborhoods if they produce excess. For example, Sage Hill Ranch Gardens is a No-Till Ecological Market Garden.
The County should lead by example by making sure in the food it serves in its institutions is climate friendly.
Is there grant money available for any of these programs?
Indigenous Knowledge
Fund programs for indigenous cultural burning and development of native plant nurseries
Land uses a big deal and should be set aside for natural and indigenous restorative agriculture
Conservation & Open Space
Programs to plant and grow trees canopies
Purchase additional lands for open space
Protect open spaces from developers… no sprawl. infill only
Preserve the last remaining Mediterranean farmland in the US…South Morro Hills, Oceanside
Hep create an independent agricultural land trust to oversee, enforce, and add additional climate solutions to the PACE lands
PACE program makes a lot of sense - please keep expanding it
Protect natural lands from land use change and invest in research of carbon storage and sequestration in natural lands.
Create wetland corridors with permaculture farming
Increase and expand wetlands
Develop wetlands
County should purchase land for conservation/remediation
Love the wildlife corridor idea
Energy

US environmental protection agency apply stricken by urban rules to waste to energy plants which requires waste to energy plants to use air pollution control devices such as scrubbers' fabric filters and electrostatic preceptors to capture air pollutants.
Offshore wind
Divesting from fossil fuels
Divest from fossil fuels. Climate Action Now. Educate.
Stop diesel- and gas-powered equipment. Natural gas is methane gas! harmful! not renewable!
Eliminate all fossil fuel use…of any kind. engines, pesticides/fertilizer, etc.
Geothermal like Lithium Valley
More microgrids
Utilize biomass, biofuel, biodiesel

Waste to Energy (pro)
Waste to energy plants make steam which turns a turbine to create electricity. That electricity can then help us power our city and state in this new world of electrification
Animal waste into renewable natural gas. Cattle are the number one agricultural source of greenhouse gases worldwide. Each year, a single Cow produces about 220 pounds of methane. Methane from cattle is shorter lives in carbon dioxide by 28 times more potent. Renewable natural gas from Manure removes a noxious source to produce electricity, heat homes, or fuel vehicles
In Imperial County cow patties were burned to create power. and wet manure was piled and covered to capture the methane which they burned for a power plant.

Waste to Energy (against)
Waste energy means methane leaks.
Reject waste to energy.

Natural Gas (pro)
Renewable natural gas projects capture this methane from existing food waste, animal manure, wastewater sludge, garbage and redirects it away from the environment repurposing it as a clean green energy source
A recent study by capital matrix consulting shows at jobs from sources like renewable natural gas pay 30% to 45% more than other so-called green jobs. The experts believe renewable natural gas will produce tens of thousands of good paying careers in the next two decades. Let's uplift our communities
Renewable natural gas is not a fossil fuel
Renewable natural gas production removes sources of pollution
Renewable natural gas takes some societies most destructive greenhouse gas sources and turns them into a tremendous net positive in a fight against climate change
Renewable natural gas is the next frontier in green energy.

Natural Gas (against)
Renewable gas is a red herring. Forget about it. We need to shut down all types of gas. Electrify.
Natural gas is destroying our planet…has no place here or anywhere else

There is NO such thing as renewable natural gas. natural gas is methane…an incredibly powerful greenhouse gas. worst thing we could do is burn "natural" gas

Sweetwater Community Meeting
San Diego County Climate Action Plan Update

Built Environment & Transportation *Energy* *Solid Waste* *Water & Wastewater* *Agriculture & Conservation*

Introduction

Tuesday, October 26, 2021
5:30 – 7:30 p.m.
Provence House
4370 Sweetwater Road,
Bonita, CA 91902

As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement with Environmental Justice Communities (EJCs)[1] to gather input and recommendations for the Climate Action Plan.

On October 26, 2021, the County hosted a meeting in the Sweetwater community, and 10 people participated. The meeting was the first of multiple meetings to reach EJCs in San Diego County. To promote the Sweetwater Community Meeting, County staff attended other meetings and events in the Sweetwater community area to speak about the meeting and its purpose, utilized County platforms and partners to share promotional flyers, and called and emailed stakeholders in the community, including residents, businesses, and community-based organizations. This summary documents the meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives

The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input.
- Promote dialogue and build connections with stakeholders to explore climate change in their community.
- Obtain input, with a focus on the Sweetwater community, to be used in helping to develop the Climate Action Plan Update and identify any concerns and additional ideas.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.

Format

The meeting was a "drop-in" event where community members could arrive at any time and participate in the activities. The activities took place in a series of five booths staffed by County project team members. At the booths, community members spoke with project team members and were invited to share their perspectives. The activities were designed for the County to learn more about the Sweetwater community and to hear community members' perspectives about climate change and potential actions to reduce greenhouse gases.

Interpreters were in attendance for community members whose primary language is Spanish and Tagalog. The meeting materials were also offered in Spanish and Tagalog.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Several participants shared that education on sustainability related topics such as community power, sustainability, and waste management, are among their top priorities.
- Many participants emphasized the importance of improving transportation: from the widespread adoption of electric vehicles to enhancements in public transportation and safety to aligning greenhouse gas emission goals with toll roads.
- Some participants expressed interest in changing current zoning designations for their community.
- Multiple participants identified climate change impacts affecting their community, including water conservation and illnesses from air pollution.
- Some participants identified potential ideas for the Climate Action Plan Update, including electric vehicles, reducing tolls, increasing bike safety, and moving towards a carbon-free county.
- Strategies related to solid waste, water and wastewater, and agriculture and conservation were all identified as potential solutions to address climate change in Sweetwater. Several participants highlighted regenerative agriculture, desalination, and the use of greywater, composting, and bringing back a County-operated recycling center.

Spring Valley Community Meeting
San Diego County Climate Action Plan Update

Built Environment & Transportation *Energy* *Solid Waste* *Water & Wastewater* *Agriculture & Conservation*

Wednesday, January 26, 2022
6:00 – 9:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement with Environmental Justice Communities (EJCs)[1] to gather input and recommendations for the CAP Update.

On January 26, 2022, the County hosted a meeting for the Spring Valley community which drew 16 participants. The meeting was the second in a series of meetings with community members in the County's EJCs. County staff worked with County departments and partners to share promotional flyers, and staff called and emailed stakeholders in the community, including residents, businesses, and community-based organizations to promote the event. This summary documents the meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input.
- Promote dialogue and build connections with stakeholders to explore climate change in their community.
- Obtain input, with a focus on the Spring Valley community, to help develop the CAP Update and identify community concerns and ideas.
- Provide an overview of the CAP Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the CAP Update.

Format
At the virtual meeting, community members participated in a staff-led presentation, polls, and a breakout session. The workshop was centered around a series of five topics, Welcome & Orientation; Tell Us About Your Community; Climate Change in San Diego County; What is the Climate Action Plan?; and What would work in your community? Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about the Spring Valley community and provided an opportunity to hear community members' perspectives about climate change and potential actions to reduce greenhouse gases.

An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Several participants shared that education on sustainability related topics such as solar energy, composting, and conversion of gas equipment to electric are among their top priorities. Additionally, local examples of sustainability are crucial, for example, local community gardens with composting or local and trusted sources for solar energy and installation.
- Many participants emphasized the importance of improved transportation: from bike and pedestrian safety to enhancements in public transportation and incentives for electric vehicles.
- Multiple participants identified climate change impacts affecting their community, including increased flooding events and heat waves and their respective impacts, such as dying vegetation and utility strains.
- Some participants identified potential ideas for the Climate Action Plan Update, including improved multi-modal options, renewable energy options, and “smart” street lighting.
- Strategies related to solid waste, water and wastewater, and agriculture and conservation were all identified as potential solutions to address climate change in Spring Valley. Several participants expressed interest in waste to energy, composting, greywater systems, and native landscapes.

North El Cajon Community Meeting
San Diego County Climate Action Plan Update

Built Environment & Transportation | *Energy* | *Solid Waste* | *Water & Wastewater* | *Agriculture & Conservation*

Wednesday, February 6, 2022
6:00 – 8:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update). the County of San Diego (County) is conducting intentional engagement within Environmental Justice Communities (EJCs)[1] to gather input and recommendations for the CAP Update.

On February 23, 2022 at 6 p.m., the County hosted a virtual meeting in North El Cajon, the fourth in a series of meetings to reach community members in EJCs in San Diego County. In advance of the meeting, staff promoted the event through e-blasts, Nextdoor posts, and partnerships with local community-based organizations and nearby libraries. This summary documents the meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input.
- Promote dialogue and build connections with stakeholders to explore climate change in their community.
- Obtain input, with a focus on the North El Cajon community, to help develop the Climate Action Plan Update and identify community concerns and ideas.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.

Format
At the virtual meeting, community members participated in a staff-led presentation, polls, and a breakout session. The workshop was centered around a series of five topics, Welcome & Orientation; Tell Us About Your Community; Climate Change in San Diego County; What is the Climate Action Plan?; and What would work in your community? Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about the North El Cajon community and hear community members' perspectives about climate change and potential actions to reduce greenhouse gases.

An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Several participants shared concerns that climate change does not feel like a priority in their community and that education to promote awareness is a necessity.
- Many participants emphasized the importance of improved transportation options: from designated bike lanes to public transit system efficiency improvements to incentives for electric vehicles and ridesharing.
- Multiple participants discussed incentives can be a compelling way for people to adopt new habits and technology. Specifically, participants were interested in incentives for residential solar installation, electric vehicles, and urban farming and community gardens.
- Some participants identified potential ideas for water resiliency such as increasing the amount of greenspace in the community to capture runoff, utilizing stormwater capture and reuse systems like rain barrels, and clarifying greywater system permitting through education and outreach.
- Strategies related to energy, solid waste, and agriculture and conservation were all identified as potential solutions to address climate change in North El Cajon and the surrounding area. Several participants highlighted renewable sources of energy, waste to energy, composting, textile/electronics collection and redistribution events, and native landscapes.

Solid Waste Conceptual Measures Workshop
San Diego County Climate Action Plan Update

Solid Waste

Wednesday June 1, 2022
6:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on conceptual greenhouse gas (GHG) emissions reduction measures.

On Wednesday June 1, 2022, County staff held a virtual public workshop to discuss conceptual measures in the Solid Waste sector, the first in a series of meetings focused on each emissions reduction sector. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 21 participants joined representing environmental, economic, and community organizations as well as individuals. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Obtain input to help develop the Climate Action Plan Update GHG reduction measures and the vision statement for the Solid Waste sector.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.

Format
At the virtual meeting, community members participated in a staff-led presentation and polling questions. The workshop was centered around three topics: Basics of Solid Waste sector emissions; Draft equitable, net-zero vision statement for the sector; Strategies and conceptual measures to reach the draft vision. Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about community members' perspectives about climate change and potential actions to reduce greenhouse gases.
An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes
Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Economic development and job creation was of interest to participants.

- Stakeholders brought up equity throughout the workshop and one participant noted that equity is what brought them to the workshop. Participants shared that increasing access to waste and recycling facilities, clean air, food, and energy would help promote equity.
- Waste to energy was of interest for some participants who suggested it as a way to turn solid waste into renewable natural gas.
- Creating a circular economy was mentioned, and one participant suggested implementing glass take-backs at grocery stores.
- Educating the community about ways to reduce waste and increase recycling, composting, and material reuse was an important topic for participants. One stakeholder suggested partnering with organizations to help repurpose waste.

Feedback on Conceptual Measures
Three conceptual measures were presented to participants:

1. Develop policies and programs to reduce, adequately separate, and/or repurpose the use of organic/ compostable and recyclable materials in County Operations.
2. Increase diversion of food, landscaping, C&D, recyclable, and other refuse items from the solid waste stream through policies and programs that reduce, adequately separate, and/or repurpose materials.
3. Improve refuse management practices to reduce emissions and support energy generation.

Stakeholders expressed interest in all conceptual measures, with a slight preference for the second conceptual measure above when asked which one was most exciting to them. Other topics that came up when asked if there were any other strategies, measures, or actions the County should consider were resource recovery and recycling, highlighting the entrepreneurial, economic development, and workforce growth component of solid waste, and waste to fuel.

Poll Everywhere Responses

Staff asked 13 questions throughout the workshop, and a total of 10 workshop participants responded.

Welcome! What brought you here today?

Total responses 13
Unique participants 7

General Interest or Curiosity.

Information

Nosey that way

Curiosity

Sustainability
Concerns about solid waste
Effects on Workplace and Industry:
Requirements for Place of Work
Workforce
EQUITY
Waste Reduction Goals & Methods:
Zero waste
waste to fuel
Renewable natural gas
Reuse
Hydrogen

I am a...

Total responses 11
Unique participants 8

Responses:	*Count*	*Percent*
Resident of the unincorporated county	3	27.27
Resident of an incorporated city (e.g., City of San Diego, Poway, Encinitas...)	4	36.36
Resident of a Native American reservation	0	0
Resident of another area (outside of SD County, on a military base, etc.)	0	0
Solid waste industry professional	0	0
Community-based organization representative	2	18.18
County employee	2	18.18
Other	0	0

Did we get it right? Does "County-wide culture of avoiding, recycling, and/or composting waste, where emissions associated with landfills have been eliminated, and people have access to recycling and compost facilities" reflect your prior comments?

Total responses 3
Unique participants 3

***Responses*:**	*Count*	*Percent*
Yes	0	0
Almost There	0	0
Not Quite	2	66.67
No	1	33.33

For those of you who think we're almost or not quite there, what else do you think should be included? *Total responses* 8 *Unique participants* 5

***Waste to energy*:**
Plastic into renewable energy
Waste to renewable natural gas
Utilizing waste to renewable sustainable energy
Biomass of waste
Economic & Equity Considerations:
Economic development and job creation through repurposing and reuse of materials
Equitable access to facilities and proper recycling and composting.
Other:
The wholly unnecessary plastic turf fields
I missed the previous page. 🙌

Are there additional ways you think we could reduce waste produced by County operations? *Total responses* 3 *Unique participants* 3

***Responses*:**	*Upvotes*	*Downvotes*
Create a circular economy	5	0
Renewable diesel	2	0
Renewable sustainable waste to energy	2	0
Partnering with orgs to repurpose waste.	2	0
Waste to Hydrogen	2	0

Biomass	2	0
Edible Food Recovery	2	1
Pyrolysis of waste	2	2
Sustainable aviation fuel	1	1
Spending getting best for now and future	1	0
Zero waste	1	0

What would make it easier for you to reduce the amount of trash you produce?

Total responses 5
Unique participants 4

***Responses*:**
There has to be an intentional, comprehensive, culturally translated education about waste and how we have created the culture of waste and how to unlearn these practices.
Build a waste processing center to create sustainable gases
Proper food storage
Reuse packaging
Waste to energy

How can we increase reuse and recycling in your community?

Total responses 8
Unique participants 4

***Policies and education*:**
Yes! We need policy changes. It's not all on the consumer. The same way we changed bag usage we can do it with other waste products. Just
The majority of greenhouse gases are from the private industry. We need business models to encourage the private industry to change
Helping community members identify what we already recycle and reuse. We do it more often than we think. Give us our props and then let's kick it up a notch and go a bit further.
Circular economy:
Glass take back in grocery stores
Circular economy is the only way to increase reuse and recycling in our communities
Waste to energy:
Waste of hydrogen is a great way to transition the fossil fuel industries
Waste to energy
Pyrolysis

Total responses 8

Which action would you most like to see implemented in your community? *Unique participants* 4

Responses:	*Upvotes*	*Downvotes*
A circular economy	3	0
Drawing on the practices of our ancestors and remembering and revisiting those practices.	2	0
Eliminate the use and generation of single use plastics in the County and edible food recovery.	2	0
Culturally translated waste education.	2	0
City should control the waste system.	1	0
All of the above approach to energy	1	0
Middle class careers created from waste projects!	1	0
drawing o	0	0

Why does reducing waste matter to you most? *Total responses* 8 *Unique participants* 4

General sustainability and Climate Action:
The governor has touted an all of the above approach. We need every opportunity to create dispatchable of all renewable sources of energy to create electricity for electrification.
There are solutions for waste. We should tap into that solution
All of it seems like such a Herculean task, #climateaction, waste is something I can personally do that seems like a no brainer. Mostly everyone can agree and get behind the fact that we shouldn't be wasteful. Other measures not so much.
Landfills are a linear system. I would like to see a solution to landfills

Future generations:
Plan for 7 generations
Defined, sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The UCLA Sustainability Committee notes: "In simplest terms, sustainability is about our children and our grandchildren, and the world we will leave them".
Our children should not inherit our landfills

Economic factors:
With electrification comes the loss of natural gas jobs. Waste to fuel is an opportunity to transition our natural gas workers

Of all the measures we shared, which one is most exciting to you? *Total responses* 6 *Unique participants* 6

Responses:	*Count*	*Percent*

Develop policies and programs to reduce, adequately separate, and/or repurpose the use of organic/ compostable and recyclable materials in County Operations.	1	16.67
Increase diversion of food, landscaping, C&D, recyclable, and other refuse items from the solid waste stream through policies and programs that reduce, adequately separate, and/or repurpose materials.	3	50
Improve refuse management practices to reduce emissions and support energy generation	2	33.33

Are there any other strategies, measures, or actions the County should consider? *Total responses* 12 *Unique participants* 5

Resource recovery & recycling:
Let's recycle solar panels and batteries with a circular economy in the future!
Enhance resource recovery- only around 20% of electronic waste is recycled- circular economy is necessary
Waste to energy:
Demonstration projects for waste to fuel
Sustainable aviation fuel is created from waste
Sustainable aviation fuel for all County Airports
Convert all waste to sustainable fuels and dramatically reduce the carbon footprint through a circular economy
Waste to renewable fuels
Renewable green hydrogen from waste
The county should really consider all of that entrepreneurship and economic development opportunities in waste diversion. The workforce component is needed. Also, education to those who aren't in these kinds of meetings. Preaching to the choir isn't gonna cut it. How do you reach folks focused on simply surviving? It's hard out here.
Just as Prince George's County Public Schools, in their CAP, transition from plastic turf to natural grass. Create organic natural grass management educational programs for schools...sustainable grass for sustainable jobs
Policies and targets:
A specific zero waste target that specifically commits to at least a 90% waste diversion or more by 2035
Let's capture all federal and state funding to solve our Waste problems

Which co-benefits are most important to you? Choose your top 3. *Total responses* *18* *Unique participants* *6*

Responses:	*Count*	*Percent*
Air Quality	0	0
Biological Resources	1	5.56
Carbon Sequestration	4	22.22
Community Health	2	11.11
Cost Savings	2	11.11
Energy Savings	1	5.56
Improved Mobility	1	5.56
Job Generation	4	22.22
Noise Reduction	0	0
Public Health	3	16.67
Water Quality	0	0
Water Savings	0	0
Other	0	0

Given the following list, what other criteria are important to you when evaluating measures? GHG reduction; Cost (to County, cost to residents); Equity considerations; Timeliness (how soon GHG reductions start); Co-benefits

Total responses 13
Unique participants 7

GHG Reduction:
GHG reduction, lower cost of energy- utilities, gas
Cost:
Cost savings
Equity considerations:
Equity, increasing access to clean air & communities as well as food. Waste diversion also leads to good, high-paying jobs.
For the trash and pollution in low-income communities' statement, I would like to add in addition to public health, how about social or self-imaging? What or how does it affect yourself image, self-esteem when you live in a systemic trash dump?
intentional and targeted outreach to less participatory segments of the populations as well as purposeful diversity
Combination of the above topics:
Carbon capture can create sustainable Aviation fuel. Let's take care of two problems at once

Lower cost, energy abundance would lead to access and equity for all
Sustainable society
Other:
Synthetic turf begins to off gas the moment they are rolled out and continue in ever increasing amounts for the 450+ years it takes for them to decompose. they represent MANY negative human and environmental health impacts, and they are NOT necessary
Electric vehicles and Hydro fuel-cell vehicles
Having a use for waste would decrease trash on freeways and in neighborhoods
Great seminar

Water & Wastewater Conceptual Measures Workshop
San Diego County Climate Action Plan Update

Water & Wastewater

Wednesday June 15, 2022
6:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on conceptual greenhouse gas (GHG) emissions reduction measures.

On Wednesday June 15, 2022, County staff held a virtual public workshop to discuss conceptual measures in the Water & Wastewater sector, the first in a series of meetings focused on each emissions reduction sector. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 19 participants joined representing environmental, economic, and community organizations as well as individuals. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Obtain input to help develop the Climate Action Plan Update GHG reduction measures and the vision statement for the Water & Wastewater sector.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.

Format
At the virtual meeting, community members participated in a staff-led presentation and polling questions. The workshop was centered around three topics: Basics of Water & Wastewater sector emissions; Draft equitable, net-zero vision statement for the sector; Strategies and conceptual measures to reach the draft vision. Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about community members' perspectives about climate change and potential actions to reduce greenhouse gases.

An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Financial incentives for water-efficient appliances and turf replacement, prioritized among multi-family and low-income residents, were popular among participants.
- Ensuring plumbers arrive in a timely manner and certifying they will fix leaks efficiently was offered to reduce water use.
- Stakeholders stated that increasing recycled water availability in the backcountry, sourcing recycled water from new sources, encouraging native plant landscaping, and providing free rain barrels would help irrigate outside areas.
- Stakeholders were generally concerned about drought conditions in the state and region, and what the County is doing to ensure water availability in the long-term.

Feedback on Conceptual Measures
Three conceptual measures were presented to participants:

1. Develop policies and programs to increase water efficiency, retention, recycling, and reuse in County operations.
2. Develop policies and programs to increase indoor and outdoor water conservation in new and existing construction in the unincorporated area.
3. Develop policies and programs to increase retention, recycling, and reuse of stormwater and wastewater.

Stakeholders expressed interest in all conceptual measures, with a slight preference for the second measure above when asked which one was most exciting to them. Other topics that came up when asked if there were any other strategies, measures, or actions the County should consider were renewable fuels from water, experimenting with innovative water capture systems such as fog fences, and support for plumbers to fix leaks.

Poll Everywhere Responses
Staff asked 13 questions throughout the workshop, and a total of 8 workshop participants responded.

Welcome! What brought you here today?	*Total responses*	*6*
	Unique participants	*4*

Climate Concerns:
The climate crisis
I am committed to finding a solution to our environmental problems

Water-Specific Concerns:
On-site water reuse
I'm concerned about the drought and want to see the plan for saving water
Concerns with wastewater treatments

Misc.:
Sustainable aviation fuel

I am a...

Total responses 6
Unique participants 5

Responses:	*Count*	*Percent*
Resident of the unincorporated county	4	66.67
Resident of an incorporated city (e.g., City of San Diego, Poway, Encinitas...)	1	16.67
Resident of a Native American reservation	0	0
Resident of another area (outside of SD County, on a military base, etc.)	0	0
Water service / utility professional	0	0
Community-based organization representative	1	16.67
County employee	0	0
Other	0	0

Did we get it right? Does "Water quality and adequacy is maintained, and emissions associated with the transportation of water are reduced through indoor and outdoor water conservation programs, efficient delivery pipelines, and reuse of stormwater and wastewater." reflect your prior comments?

Total responses *5*
Unique participants *5*

Responses:	*Count*	*Percent*
Yes, this Vision Statement reflects my prior comments	0	0
Almost There	3	60
Not Quite	1	20
No, this Vision Statement does not reflect my prior comments	1	20

For those of you who think we're almost or not quite there, what else do you think should be included?

Total responses 9
Unique participants *6*

Water Conservation:
We are less than a year before Lake Powell and Lake Mead dry up completely. Does the County have a water emergency plan in place if we lose our access to Colorado River water?
There will probably be no Colorado river and no snowpack. Rain will be unreliable.
You must state that if we destabilize our climate, all bets are off. We will go extinct, one way or another.
I'm confused because you said that this was only about emissions, but it should be about overall water conservation.

Alternative Water Sources:
Desalination
Easier access to ground water
On-site water reuse is a great idea!
Wastewater Reuse:
Wastewater to renewable fuels
Sustainable aviation fuel from wastewater sludge.

Are there additional ways you think we could decrease potable water use in County operations?

Total responses 4
Unique participants 4

***Responses*:**	*Upvotes*	*Downvotes*
High-efficiency heat pumps	2	0
On-site water reuse	2	0
Admit that we live in a desert and stop promoting lush greenery.	1	1
Committing to adopting ordinances for water conservation for all municipal buildings	1	0

What would make it easier for you to reduce the amount of potable water you use?

Total responses 12
Unique participants 6

***Responses*:**
Develop a regional stormwater harvesting and reuse plan.
If a plumber says they will come out a fix a leak, they should be required to do it within some time or help get another plumber to do it.
Creating a license for plumbers in the county
Utilizing licensed plumbers to minimize errors and leaks
Water quality standards
Financial incentives to change out toilet.
State money for stormwater recapture
Educational and certificate programs for landscapers to learn about natives
Rebates not only for replacing turf, but also replacing high- and moderate- use plants with native plants
Subsidize paying for plumbers. Leaking pipes need to be fixed ASAP.
New construction to promote composting toilets, hot water circulators, xeriscaping.
Residential on-site water reuse grant

How can we help decrease potable water use in your community?

Total responses 6
Unique participants 6

Incentives:
Prioritize rebates for affordable housing units

Free rain barrels
Community Considerations:
Apartment complex on-site water reuse to community gardens
Find new sources of recycle water for outdoor use
Bring recycled water to the east county, not just the coast
Requirements:
On-site water reuse ordinance across the county

Which action would you most like to see implemented in your community?

Total responses *5*
Unique participants *5*

***Responses*:**	*Upvotes*
License plumbers to ensure the systems are working correctly and delivering clean water	1
The County should partner with CWA and local water agencies to develop and fund emergency plans in case we lose access to Colorado River water.	0
reduction/elimination of watering for the sake of appearances only.	0
Help with replacing high-use landscaping	0
On-site water reuse ♻️	2

Why does reducing potable water use matter to you most?

Total responses *6*
Unique participants *4*

Drought concerns:
California faces the loss of water from the Central Valley Project and the Colorado River. When the Colorado River runs dry, all of the County Water Authority's water rights will become useless.
Coastal California water usage has increased 15% recently
It's scary how little it has rained this spring
Inland California is severely affected by the drought and does not have access to desalination
Water Logistics:
We need to decrease water usage but also increase our supply
Realizing how much distance is involved in getting our water should scare everyone.

Of all the measures we shared, which one is most exciting to you?

Total responses *6*
Unique participants *6*

***Responses*:**	*Count*	*Percent*

Develop policies and programs to increase water efficiency, retention, recycling, and reuse in County operations.	1	16.67
Develop policies and programs to increase indoor and outdoor water conservation in new and existing construction in the unincorporated area.	3	50
Develop policies and programs to increase retention, recycling, and reuse of stormwater and wastewater.	2	33.33

Are there any other Water & Wastewater strategies, measures, or actions the County should consider?

Total responses 6

Unique participants 5

Wastewater to Energy:
Renewable fuels from water- fertilizer, etc.
Sustainable Aviation Fuel

Innovation and Labor:
Experiment with innovative water capture systems, i.e. fog fences, etc.
The County should figure out a way to help get plumbers to fix leaks.

Question:
Is agricultural water use included?

Given what we just discussed, which co-benefits are important to you? Select all that apply

Total responses 34
Unique participants 6

***Responses*:**	*Count*	*Percent*
Improve community health	3	8.82
Conserve farmland	1	2.94
Save money on utility bills	4	11.76
Save public tax dollars	1	2.94
Improve air quality	2	5.88
Increase energy security/resilience	2	5.88
Conserve water	6	17.65
Conserve habitat	4	11.76
Create green jobs	4	11.76
Reduce noise	1	2.94
Promote environmental and social justice	4	11.76
Improve access to electric vehicles	0	0
Improve walking, biking, rolling, and transit options	2	5.88

Given the following list, what other criteria are important to you when evaluating measures? Rank the following: support co-benefits; support equity and environmental justice; reduce GHG emissions quickly; reduce costs to residents and businesses; save taxpayer money

Responses:	*Rank*
Support co-benefits	2
Support equity and environmental justice	4
Reduce GHG emissions quickly	1
Reduce costs to residents and businesses	2
Save taxpayer money	5

Energy Conceptual Measures Workshop
San Diego County Climate Action Plan Update

Energy

Tuesday June 28, 2022
6:00 p.m.
Zoom

Introduction

As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on conceptual greenhouse gas (GHG) emissions reduction measures.

On Tuesday June 28, 2022, County staff held a virtual public workshop to discuss conceptual measures in the Energy sector, the first in a series of meetings focused on each emissions reduction sector. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 23 participants joined representing environmental, economic, and community organizations as well as individuals. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives

The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Obtain input to help develop the Climate Action Plan Update GHG reduction measures and the vision statement for the Energy sector.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.

Format

At the virtual meeting, community members participated in a staff-led presentation and polling questions. The workshop was centered around three topics: Basics of Energy sector emissions; Draft equitable, net-zero vision statement for the sector; Strategies and conceptual measures to reach the draft vision. Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about community members' perspectives about climate change and potential actions to reduce greenhouse gases.
An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Electrification across all sectors (transportation, buildings, agriculture, etc.) was a popular solution stakeholders mentioned to reduce greenhouse gas (GHG) emissions.
- Incentives for electric appliance replacements were noted as a way to decrease energy use.
- Participants noted that increasing renewable energy, both on the regional and personal/residential scale, would help reduce GHGs from energy use.
- Enacting any measures in an equitable manner was stressed as an important component of this sector.
- Discussion of the difference between energy use and energy efficiency came up, with one stakeholder noting that an efficient appliance delivers the same result with less energy.

Feedback on Conceptual Measures
Six conceptual measures were presented to participants:

1. Prioritize Energy Efficiency of County Facilities and Achieve XX% by 2030.
2. Increase energy efficiency and convert XX amount of Gas Appliances in Existing Buildings in the Unincorporated Area.
3. Achieve Electrification of XX% of New Buildings in the Unincorporated Area by 2030.
4. Increase Renewable Energy Production and Storage at County Facilities by XX% by 2030.
5. Increase Solar Photovoltaics and Energy Storage in the Unincorporated Area by XX% by 2030.
6. Reduce the Reliance on Gas and Diesel Generators in County Operations and in the Unincorporated Area.

Stakeholders expressed interest in all conceptual measures, with a slight preference for the first measure above when asked which one was most exciting to them. Other topics that came up when asked if there were any other strategies, measures, or actions the County should consider were to hire a new County energy czar, include equity in the measures, provide resources to help reduce residential energy use, and regulate producers to ensure the generation of high-quality energy.

Poll Everywhere Responses
Staff asked 14 questions throughout the workshop, and a total of 18 workshop participants responded.

Welcome! What brought you here today?

	Total responses	*7*
	Unique participants	*5*

General Interest or Curiosity:
Interest in the CAP update policy goals and its impact on the County staff structure.
Understanding CAP
Interest in the CAP's understanding of sustainability
Want to know what the county has planned and have input
Energy-Specific:

Affordable energy
Energy
Targets:
Net-zero emission targets

I am a…

Total responses	*11*
Unique participants	*8*

Responses:	*Count*	*Percent*
Resident of the unincorporated county	4	36.36
Resident of an incorporated city (e.g., City of San Diego, Poway, Encinitas…)	2	18.18
Resident of a Native American reservation	0	0
Resident of another area (outside of SD County, on a military base, etc.)	0	0
Energy/utility professional	2	18.18
Community-based organization representative	3	27.27
County employee	0	0
Other	0	0

Did we get it right? Does "Renewable, carbon-free energy systems power efficient buildings and result in resiliency, lower emissions, and reduced costs" reflect your prior comments?

Total responses	*11*
Unique participants	*11*

***Responses*:**	*Count*	*Percent*
Yes, this Vision Statement reflects my prior comments	1	9.09
Almost There	7	63.64
Not Quite	2	18.18
No, this Vision Statement does not reflect my prior comments	1	9.09

For those of you who think we're almost or not quite there, what else do you think should be included?

Total responses	*10*
Unique participants	*9*

***It's Electric*:**
45 % of the GHG are cars and trucks. There is no other way to get around the County. Why aren't electric cars the major GHG reduction tool?
all-electric language
General Environment & Equity Considerations:
There is no mention of climate justice or frontline communities
Total environmental impact needs to be considered.
Implementation:

When the board adopts energy policy goals, they also need to identify County staff who will be responsible for ensuring that those goals are achieved. Someone needs to be accountable.
by 2035

Clarification on Energy:

Net zero energy
Clean energy
potentially something about "distributed energy resources"
Local energy production and storage

What actions would you like to see the County take to reduce energy use?	*Total responses*	*9*
	Unique participants	*8*

***Responses*:**	*Upvotes*	*Downvotes*
Replace all fluorescent light fixtures with LED lighting in all County facilities.	2	1
Develop nuclear clean energy	1	2
Commit to electrifying all County-owned buildings by 2035.	2	2
Retrofit air conditioning systems in all county facilities, to prevent rolling brownouts in hot summer days.	2	0
Commit to passing a reach code to ban new methane gas for all new development	3	2
Cool roofs are a great idea!	3	0
Thermal district heating and cooling in the city	2	0
Ban gas hookups in all new construction immediately	3	3
Ban crypto throughout the county	2	1

What would make it easier for you to use less energy?	*Total responses*	*18*
	Unique participants	*10*

***Responses*:**

Population limitations to reduce use
Solar curtailment is when solar energy produces too much energy than is used then sold for less than fair value
SDCP is a CCA that is developing a community power plan to reinvest profits into communities of concerns and green jobs
CCA's should be regulated to ensure the delivery to quality power.
By constantly allowing SDG&E to raise its rates, the CPUC is encouraging customers to use less energy every day.
The county needs to take a stand on the efforts by the CPUC to make it hard for homeowners to install rooftop solar
There are options to the current energy generation schemes, depending on the goals they can create different environmental effects.

Encourage the new local CCAs to develop new energy efficiency programs to serve the customers they purchase energy for.
What will you do with solar curtailing this causes?
You should distinguish between energy usage and energy services. An efficient appliance delivers the same result with less energy.
Funding, incentives and rebates for efficient, electric appliances and efficiency retrofits.
Passive cooling remodel or upgrades
If SDG&E took control of its energy efficiency programs away from the CPUC Energy Division and focused them on helping local customers do more.
being able to install affordable all electric appliances in my home
Timers/switches on outlets that turnoff unnecessary appliances from 4-9pm
Live grid updates to know when draw is high
My exact question.
Why do I want to use less energy?

What are other strategies the County can require or incentivize to increase the use of energy efficient appliances?

Total responses 8
Unique participants 6

Programming and Equity:
Work with the CPUC to ensure that utility and CCA energy efficiency programs are expanded serve more local customers.
Resource & planning aid for upgrading
Replace gas in a per neighborhood basis in underserved communities.
Commit to establishing strong, equitable retrofit measures for existing buildings, such as developing a comprehensive all-electric retrofit plan that will prioritize environmental justice communities
Incentive to replace all gas appliances in a home
Have a recycling program for old appliances

Other:
Promote home ownership. Landlords typically do not invest in energy saving appliances.
It will be almost impossible to convince people to tear out gas furnaces and stoves and replace them with electric ones. Even if the county paid for it.

How interested are you in seeing more solar installed on buildings and houses in your community?

Total responses 11
Unique participants 11

Responses:	*Count*	*Percent*
Very interested	8	72.73
Somewhat interested	0	0

Neutral	1	9.09
Not really interested	0	0
Not interested at all	2	18.18

What are other ways we can move away from using gas or diesel generators?	*Total responses* 10 *Unique participants* 7	
***Responses*:**	*Upvotes*	*Downvotes*
Ammonia can also be used as a clean fuel	0	0
If rooftop solar and batteries were installed on 45% of the roofs and parking lots in the county, all our power could come from the sun.	0	0
Equitable Electrification	2	1
Install rooftop solar and batteries to power those county facilities and homes countywide.	3	1
Renewable drop in fuel for generators- renewable diesel	2	1
on-site solid oxide fuel cells or hydrogen fuel cells are a zero-emission and renewable (green hydrogen, SB 1383 biomethane)	2	1
Hydrogen energy systems, hydrogen generators	3	2
nuclear power (SMRs)	2	1
V2G capable cars and trucks can act as backup power	1	1
Use hydrogen generator	2	2

Why is reducing energy use important to you?

Total responses 15
Unique participants 10

Environmental Concerns:
The environment will not survive unless we get our energy use under control and stop burning fossil fuels.
Because energy use creates greenhouse gases which hit communities of concern the hardest. It is an environmental and equity issue.
To maintain a stable climate
Global warming
Cost:
Cost, strategic importance, and reducing GHG
Saves money
Cost
Clean Energy and Energy Efficiency:
Rationing energy no longer works while we are having drastic weather changes. Clean energy is abundance is a necessity
Energy reduction is not a goal … energy efficiency is a goal
reducing energy use improves energy infrastructure resilience
Everyone can do their part to help make reductions in their own home and businesses

There should be clean energy abundance
With reduced level of hydro power, we all need to reduce our consumption.
Other:
National security
It's not

Of all the measures we shared, which one is most exciting to you?	*Total responses*	*6*
	Unique participants	*6*

***Responses*:**	*Count*	*Percent*
Region: Other	0	0
Region: Energy efficiency at County	3	30
Region: Convert appliances in existing buildings	2	20
Region: Electrification of new buildings	1	10
Region: Renewable energy at County facilities	2	20
Region: Solar and storage in unincorporated county	1	10
Region: Reduce gas/diesel generator reliance at County and in community	1	10

Are there any other Energy strategies, measures, or actions the County should consider?	*Total responses*	20
	Unique participants	7

***Offshore Wind*:**
Nn shower wind is a good use in SOCAL
Offshore wind will not work in Southern California- military operations and deep ocean floor as well as migratory whales
Offshore wind is not efficient in SOCAL
The Navy has blocked offshore wind off San Diego and Southern California due to its training needs.
Offshore wind has not appeared in the list
Hydrogen:
Green hydrogen
A measure not to consider: Hydrogen as a heating measure mixed into the natural gas lines!
Implementation:
Identifying funding sources from state and federal government
Don't hire additional staff … reassign
Hire a new County energy czar and give them the power to make sure the County's energy goals are met, working with department chiefs.
None of the draft measure currently mention equity
Consider total environmental impact in the development of energy sources.
Circular Economy:
Nuclear energy reprocessing from spent nuclear fuel

On-site water reuse
Circular economy
Waste to energy
Additional Pathways:
Further breakdown of sources of residential energy use & education/resources to help reduce use by habit changes / upgrades
Do not consider a single energy supply as a complete answer.
Regulate producers to ensure the generation of high-quality energy
Stop wasting energy, maximize rooftop solar and battery use.

Given what we just discussed, which co-benefits are important to you? Select all that apply

Total responses	*58*
Unique participants	*10*

Responses:	*Count*	*Percent*
Improve community health	6	10.34
Conserve farmland	4	6.9
Save money on utility bills	7	12.07
Save public tax dollars	4	6.9
Improve air quality	6	10.34
Increase energy security/resilience	6	10.34
Conserve water	4	6.9
Conserve habitat	2	3.45
Create green jobs	8	13.79
Reduce noise	1	1.72
Promote environmental and social justice	5	8.62
Improve access to electric vehicles	0	0
Improve walking, biking, rolling, and transit options	5	8.62

Given the following list, what other criteria are important to you when evaluating measures? Rank the following: support co-benefits; support equity and environmental justice; reduce GHG emissions quickly; reduce costs to residents and businesses; save taxpayer money

Responses:	*Rank*
Support co-benefits	2
Support equity and environmental justice	3
Reduce GHG emissions quickly	1
Reduce costs to residents and businesses	4
Save taxpayer money	5

Agriculture and Conservation Conceptual Measures Workshop
San Diego County Climate Action Plan Update

Agriculture and Conservation

Tuesday July 19, 2022
6:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on conceptual greenhouse gas (GHG) emissions reduction measures.

On Tuesday, July 19, 2022, County staff held a virtual public workshop to discuss conceptual measures in the Agriculture and Conservation sector, the fourth in a series of meetings focused on each emissions reduction sector. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 36 participants joined representing the agriculture community, unincorporated residents, and local resource conservation organizations. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Obtain input to help develop the Climate Action Plan Update GHG reduction measures and the vision statement for the Agriculture and Conservation sector.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.

Format
At the virtual meeting, community members participated in a staff-led presentation and polling questions. The workshop was centered around three topics: Basics of Agriculture and Conservation sector emissions; Draft equitable, net-zero vision statement for the sector; Strategies and conceptual measures to reach the draft vision. Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about community members' perspectives about climate change and potential actions to reduce greenhouse gases.

An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes

Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Agriculture and agricultural lands have a tremendous potential to address climate change and reduce greenhouse gas emissions.
- Participants were particularly interested in a regional carbon farming program and how that could improve soil health among other benefits.
- Education is a key component of success in this emission sector, especially as it relates to native foods, plants, and seasonal eating.
- Wildlife habitats and open spaces also need to be considered, not just land for human access.
- It is also important to be cognizant of the nexus between agriculture and water use.

Feedback on Conceptual Measures

Nine conceptual measures were presented to participants:

1. Acquire open space conservation lands to increase carbon sequestration benefits.
2. Develop and implement a tree canopy assessment and program to plant trees within the unincorporated area, with priority for underserved communities.
3. Promote and prioritize tree preservation and green infrastructure in residential and non-residential development, and in County projects.
4. Avoid conversion of agricultural lands to developed uses through the placement of easements.
5. Create a food sourcing strategy for County operations that prioritizes local, equitable, and sustainable food suppliers.
6. Incentivize the use of feed additives and/or improve forage quality to reduce emissions from enteric fermentation.
7. Increase energy efficiency of agricultural operations through retrofits and equipment conversion.
8. Work with regional partners to develop a Carbon Farming Program to incentivize the use of climate friendly practices in local agriculture.
9. Work with regional partners to incentivize nutrient management techniques to reduce synthetic fertilizer use.

Stakeholders expressed interest in all conceptual measures, however carbon farming arose as a top interest. Also, participants suggested revisiting conceptual measure number six to ensure its relevancy to the local region. Other topics that came up when asked if there were any other strategies, measures, or actions the County should consider included

- More promotion of the PACE program,
- Support replacement of water needy crops with more drought tolerant varieties.
- Open County-owned land up to prescribed grazing and burns.
- Work on riparian restoration.
- Increase private development tree planting requirements and increase the number of trees in parking lots.
- Strategically place carbon sinks throughout the county.

Poll Everywhere Responses

Staff asked 11 questions throughout the workshop, and a total of 27 workshop participants responded.

Welcome! What brought you here today?	*Total responses* 19 *Unique participants* 17

General Interest or Curiosity:
Climate and natural resources enthusiast and finding solutions for everyone
Nature enthusiast
Belong to Fallbrook Climate Action Team and I want to stay up to date on CAP and also as an Avocado Producer want to know what we can do.
Concern over the future
Work in enviro policy
Staying up to date on the decarb plan
Here for information due to my work and role.
Climate-Friendly Agriculture:
Concern about agriculturally zoned areas accommodating industrial ag and converting the areas to unsuitable quality of life.
Interested in carbon farming and land conservation for carbon sequestration
Agricultural interest as a resident
Work in ag sector
Agricultural interest
I am interested in environmental issues and preserving agricultural land and other open space. I am very concerned about the climate crisis.
I am a rancher and interested in what the plans are in the county as it relates to ranchers.
Interested in revitalizing soil and learning more about the agriculture in San Diego
As a farm advisor, I am excited to share how agricultural lands can be a huge asset for carbon sequestration.
Interested in preserving ag lands
Habitat & Conservation:
Habitat conservation
I'm a resident and I'm interested in conservation.

I am a... *Total responses* 29 / *Unique participants* 21

Responses:	*Count*	*Percent*
Resident of the unincorporated county	10	34.48
Resident of an incorporated city (e.g., City of San Diego, Poway, Encinitas...)	7	24.14
Resident of a Native American reservation	0	0
Resident of another area (outside of SD County, on a military base, etc.)	1	3.45
Agricultural professional	4	13.79
Community-based organization representative	3	10.34

County employee	2	6.9
Other	2	6.9

Did we get it right? Does the vision statement, "Natural and agricultural lands are preserved to capture carbon, support the local food and farming community, and provide access to healthy outdoor spaces" reflect your prior comments?

Total responses 17
Unique participants 17

Responses:	*Count*	*Percent*
Yes, the vision statement reflects my prior comments	6	35.29
Almost There	9	52.94
Not Quite	1	5.88
No, the vision statement does not reflect my prior comments	1	5.88

For those of you who think we're almost or not quite there, what else do you think should be included?

Total responses 14
Unique participants 8

Education:
Education about native foods and plants
Should include language around educating and promoting seasonal eating and the consumption of less carbon-intensive foods
Agriculture and Climate Impacts:
We need to adapt our landscape management to new climatic conditions with more fire and less water – this transition will require investment
Opportunities to innovate for more effectively addressing climate change
Promoting Working Lands:
Plants that are considered “carbon sinks” should also be encouraged for cultivation
Agricultural lands should not just be preserved but actively promoted and directly supported
Healthy working lands optimize both biodiversity and food production – prescribed grazing is an ideal example
Water and crop waste should be used to the fullest potential
Is “preserved” the most appropriate word to use? We need to invest in and cultivate these landscapes to make sure they are thriving to their fullest potential
Land and Habitat Conservation:
There needs to be specifics around that conserving and restoring natural lands, such as canyons, open spaces, and wetlands/marshlands to sequester carbon, support biodiversity, and promote clean water
Open space and wildlife land purchases. Toughen up the hurdles for development on unincorporated lands
Protection of habitat lands and open space for habitat and biological diversity. Not only human access
Must include restoration of previously degraded habitat areas
Wildlife and habitat connectivity needs to be included

17

Why is reducing emissions in the Agriculture and Conservation sector important to you?	*Total responses*	
	Unique participants	*14*

Carbon Sequestration:
Soil needs to be revitalized and the UN has made a lot of scary predictions that soil degradation can lead to climate change. Therefore, reducing emissions through carbon sequestration is important!
Because they provide some of the most direct and least costs to bury carbon in the ground. Exhaust from diesel equipment is a large emitter.
Because habitats help regulate carbon in the atmosphere and sequestration and it is important to conserve it and biodiversity is so present in our county.
Conservation can help sequester carbon while also providing food & habitat for our native wildlife.
We need to address GHG sequestration through natural solutions because land conservation and biodiversity is really important.
Preservation of natural habitat can help stabilize the climate
Agricultural Industry Considerations:
Ag is a key part of broader conservation efforts and there are various regional and sub-regional opportunities.
Ag is important for so many reasons, as shown in the vision
Sustainable use of land that Preserves Species and biodiversity and is thoughtfully managed for food production to support food security.
Environmental concerns and the fear of agriculture dying as an industry in San Diego
I love our County! Agriculture and Conservation represent the best we have to offer and are a pathway to keeping our County strong through a changing climate.
An example in how to turn ag into resource- cow bedding straw has up to 10 times more energy than cow manure.
I believe the biggest emitters from the agricultural community could be turned into a big resource in cleaning the environment- ag waste to renewable fuels and diesel generators can be fueled by renewable diesel
General Comments:
Every sector of society must reduce GHG to reduce impacts of climate change.
To slow and/or reverse the impacts of climate change.
Improve quality of life
"Passive" measures + active measures for addressing climate change.

What are other actions the County could take to sequester carbon?	*Total responses*	*20*
	Unique participants	*14*

Responses:	*Upvotes*	*Downvotes*
Include a strong native plant ordinance and preserving habitat outside of the MSCP given the only one has been adopted so far	4	0
Prioritizing habitat health by keeping connectivity	3	0

Include restoration of natural lands in addition to acquisition	3	0
Require developers to plant trees and increase the number of trees in parking lots	3	0
Restore degraded sites with native landscaping	2	0
Riparian restoration	2	0
Having "carbon sinks" planted strategically throughout the county	2	0
Investigate air carbon capture and sequester technologies and if they work, adopt them. Use fallowed ag land for new solar and wind farms.	1	0
On-site water reuse where possible. Maybe community water reuse to restore nitrogen in soil	1	0
Prescribed burns to restore native oak woodland	1	0
Promoting and adding to the urban forests. Involving homeowners and apartments to create carbon sinks	1	0
Open up more county owned land to prescribed grazing to increase carbon sequestration. This is required in brittle/semi-brittle environments	1	0
Much like the State Agricultural Healthy Soils Program: Compost application on crop land, Mulch application on orchards, Rotational grazing on rangelands	1	0
Do a much better job of promoting the PACE program. Come up with more concrete actions the county can take to get more farmers to sign up for it.	0	0
Replace older water needy crops on farms with newer more drought tolerant varieties, a la Crop Swap	0	0
Provide financial incentives to implement GHG activities to Ag producers and growers	0	0
Shrubs and other plants can also sequester carbon, not everyone has space for a tree	0	0
Whatever you do must be coordinated with the water conservation and supply section of the CAP update	0	0
Plant fallow crops and incorporate into soil	0	0
Build soil health- give incentives to landowners and farmers	0	0

How interested are you in these actions (easements, food sourcing strategy) for the County to preserve agricultural lands?

Total responses 16
Unique participants 16

Responses:	*Count*	*Percent*
Very interested	13	81.25
Somewhat interested	2	12.50
Neutral	0	0
Not really interested	0	0
Not interested at all	1	6.25

Of the measures relating to climate farming practices, which one is most exciting to you?

Total responses 16
Unique participants 16

Responses:	*Count*	*Percent*
Regional carbon farming program	13	81.25
Increase energy efficiency	2	12.50
Reduce synthetic fertilizer	1	6.25
Incentivize feed additives	0	0
Other	0	0

Are there any other Agriculture and Conservation strategies, measures, or actions the County should consider?

Total responses 1
Unique participants 1

Prescribed grazing:
The county needs to open up more land to grazing. We are swimming in dead plants that are ready to burn. The land must be grazed to prevent a massive release of carbon.

Given what we just discussed, which co-benefits are important to you? Select all that apply

Total responses 108
Unique participants 16

Responses:	*Count*	*Percent*
Improve community health	11	10.19
Conserve farmland	11	10.19
Save money on utility bills	3	2.78
Save public tax dollars	5	4.63
Improve air quality	12	11.11
Increase energy security/resilience	6	5.56
Conserve water	15	13.89
Conserve habitat	12	11.11
Create green jobs	11	10.19
Reduce noise	1	0.93
Promote environmental and social justice	11	10.19
Improve access to electric vehicles	4	3.7
Improve walking, biking, rolling, and transit options	6	5.56

Given the following list, what other criteria are important to you when evaluating measures? Rank the following: support co-benefits; support equity and environmental justice; reduce GHG emissions quickly; reduce costs to residents and businesses; save taxpayer money

Total responses 13
Unique participants 13

Responses:	*Rank*
Support co-benefits	1
Support equity and environmental justice	3
Reduce GHG emissions quickly	2

Reduce costs to residents and businesses	4
Save taxpayer money	5

Built Environment and Transportation Conceptual Measures Workshop
San Diego County Climate Action Plan Update

Built Environment and Transportation	*Wednesday August 24, 2022* *6:00 p.m.* *Zoom*

Introduction

As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on conceptual greenhouse gas (GHG) emissions reduction measures.

On Wednesday August 24, 2022, County staff held a virtual public workshop to discuss conceptual measures in the Built Environment and Transportation, the fifth in a series of meetings focused on each emissions reduction sector. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 28 participants joined representing unincorporated residents, community-based organizations, and concerned residents from incorporated cities. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives

The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Obtain input to help develop the Climate Action Plan Update GHG reduction measures and the vision statement for the Built Environment and Transportation sector.
- Explore opportunities and challenges related to greenhouse gas reduction measures that may be considered for the Climate Action Plan Update.
- Provide an overview of the Climate Action Plan Update in a clear and easy to understand way, including the purpose, process, outcomes, timeline, and future opportunities to provide input.

Format

At the virtual meeting, community members participated in a staff-led presentation and polling questions. The workshop was centered around three topics: Basics of Built Environment and Transportation sector emissions; Draft equitable, net-zero vision statement for the sector; Strategies and measures to reach the draft vision. Throughout the workshop, community members were invited to share their perspectives through the chat, polls, and open discussion. The workshop and prompts were designed so that staff could learn more about community members' perspectives about climate change and potential actions to reduce greenhouse gases.

An interpreter was in attendance for community members whose primary language is Spanish. The meeting materials were also offered in Spanish.

Major Themes
Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Stakeholders wanted to see more of an emphasis on public transportation and opportunities to improve the systems and increase ridership.
- Equity considerations related to increasing electric vehicle access to all communities, including low-income individuals and renters.
- Electric vehicles play an important role in decarbonizing the Built Environment and Transportation sector, but we should do more than replace fossil fuel-powered cars with electric cars.

Feedback on Conceptual Measures
Nine conceptual measures were presented to participants:

1. Reduce the County's fleet and small equipment emissions XX% by 2030.
2. Install 2,040 electric vehicle charging stations by 2030 and provide incentives for ZEVs in the unincorporated areas.
3. Increase the use of low-carbon and zero-emission landscaping equipment and construction equipment in the unincorporated area.
4. Reduce emissions from loading docks and vehicle idling in the unincorporated area.
5. Reduce the number of miles traveled in car by County employees by XX% by 2030.
6. Improve County roads so they're more user-friendly for bikes, pedestrians, etc.
7. Reduce vehicle miles traveled in car in the unincorporated area by XX% by 2030 from new development.
8. Support walking, biking, transit, ride hailing, and carsharing in the unincorporated area.
9. Improve traffic operations on County roadways.

Stakeholders expressed interest in all measures, however decarbonizing on-road and off-road vehicle fleet and shifting towards alternative modes of transportation were of more interest than improving traffic efficiency other topics that came up when asked if there were any other strategies, measures, or actions the County should consider included.

- Make public transportation free
- Monorail to airport
- Free or very cheap public transportation. EV shuttles at beaches, etc
- Develop a Bicycle Master Plan, a Pedestrian Master Plan, an Active Transportation Plan, or updating an existing biking and walking plans with robust measures and goals
- Emphasizing funding in grants for low-income communities to shift vehicles, incentivizing small businesses, more access to public transit, green jobs near us, and fixing County road infrastructure
- Provide EV charging infrastructure for those living in apartments.

- Amend local regulations and policies to allow for wider sidewalks and the use of setbacks for public spaces, and/or implement temporary and permanent car-free zones/zero emission zones.
- EV charging and solar for multi-unit housing. Creative incentives for landlords and management companies. Also use malls, box stores, etc as micro grids with solar on roofs and parking lots
- Enhance public transportation in unincorporated area. Why can't we create our own?
- How can we encourage sustainability in existing development, not just new development?
- Not punishing the poor through VMT and Idling fines and fees.
- Develop a Mobility Action Plan (or similar plan) outlining all of the strategies needed to achieve mode shift targets.
- Are there strategies for decarbonizing cross-border transit/vehicle use? (maybe that is beyond the County's jurisdiction)
- There wasn't enough public transit in these measures.
- Set aggressive and specific VMT reduction and mode shift targets for biking, walking, and transit. For example, the City of San Diego just adopted a CAP with a citywide 50% mode shift target for biking, walking, and transit.
- Change building code to remove requirements for parking spots.

Poll Everywhere Responses

Staff asked 13 questions throughout the workshop, and a total of 15 workshop participants responded.

Welcome! What brought you here today?

Total responses	9
Unique participants	9

***General Interest or Curiosity*:**
i am interested in what the county is doing to combat climate change
Want to see SD adopt strong climate policy
Interested in sustainability
Interest in CAP process.
I'm concerned about climate change, and am interested in what the county is doing to combat it.
Industry Interest:
Participating on behalf of the SD Regional Chamber of Commerce -- our members are interested in CAP, sustainability, and industry.
Advocate for strong building electrification goals
I am interested in the interaction between CAP and VMT.
Environmental Justice:
I want to understand how communities in North County San Diego can be labeled Enviro Justice communities. High fire, food insecurity, less access to transit, etc.

I am a…

Total responses	15
Unique participants	10

Responses:	*Count*	*Percent*
resident of the unincorporated county	4	26.67
resident of an incorporated city (e.g., City of San Diego, Poway, Encinitas...)	6	40
resident of a Native American reservation	0	0
resident of another area (outside of SD County, on a military base, etc.)	0	0
Built environment/transportation professional	1	6.67
community-based organization representative	3	20
County employee	0	0
other	1	6.67

Did we get it right? Does the vision statement, "Complete communities that leverage the unique characteristics of unincorporated area communities, support critical services and amenities such as retail, parks, and libraries, include accessible options such as sidewalks and bike lanes, and where infrastructure to support zero emission vehicles is widely available." reflect your prior comments?

Total responses 9
Unique participants 9

Responses:	*Count*	*Percent*
Yes, the vision statement reflects my prior comments	1	11.11
Almost There	6	66.67
Not Quite	2	22.22
No, the vision statement does not reflect my prior comments	0	0

For those of you who think we're almost or not quite there, what else do you think should be included?

Total responses 10
Unique participants 8

Clarifications:
The sentence seems to limit scope to unincorporated County. Is that correct?
The wording itself is a bit awkward. The first word 'complete' specifically. A community is never complete.
The term "built environment" is confusing since it doesn't include buildings
N/A

More Detail:
Retail should be rephrased to "local businesses" or "local retail and services;" there should be an express reference to multimodal transportation.
Not sure. But definitely include fire risks and food security aspect.

Fueling Considerations:
Renewable fuels and sustainable gasoline and diesel should be available at current gas stations in the county.
More opportunities for hydrogen fueling stations need to be deployed. The current hydrogen personal cars cost 1/2 as much as a battery ev.

Promoting Other Transportation Options:
More emphasis on public transportation. Electric bikes are a way to provide last mile for public transit. Just replacing cars with EVs is not a solution.
The vision statement should specifically address the fact that the only way to slash transportation emissions is to shift commuters out of their cars and into more sustainable modes, allowing commuters to have shorter trips in village centers and away from dangerous and unsustainable high fire zoned areas.

Why is reducing emissions in the Built Environment and Transportation sector important to you?

Total responses 10
Unique participants 7

Zero-Emission Vehicles:
With the cost of battery electric vehicles and to cost of raw materials through the roof, it's not a viable option for everyone
If we imagine a 100% EV transportation mode and infrastructure, it completely changes VMT factors and allows greater development of unincorporated communities.
Transportation is a both a constraint/enabler of economic development -- shifting our transportation modes to be zero emission is critical for sustainable economic development
Equity. Renewable fuels can have the biggest impact in the transportation sector- up to 80% reduction of GHG gallon for gallon by replacing drop in fuels.
Equity and Public Health:
It's either gas or food or rent in the backcountry
My community needs more access to jobs near us and/or more public transportation. Also, asthma.
Reduce air pollution, and reduce carbon dioxide increase to the atmosphere
Climate Change:
Climate change
Transportation is a both a constraint/enabler of economic development -- shifting our transportation modes to be zero emission is critical for sustainable economic development
Because of the direct causal impact on climate change.

Does the strategy "Decarbonize on and off-road vehicles" make sense for your community? Why/why not?

Total responses 7
Unique participants 5

Responses:	*Upvotes*	*Downvotes*
Is the expansion of public transit in the unincorporated communities not part of the equation?	0	0
Renewable fuels make sense to me, however penalizing idling cars more than a few seconds doesn't make sense to me if the fuels are Net zero or near zero	1	0
Must be incentives for multi-unit housing…renters MUST be part of the plan	1	0

Kinda. Could there be more funding allocated for low-income programs access to these vehicles?	2	0
As part of strategy to reduce vehicle miles traveled. Should include incentives to move to smaller vehicles (3 wheels, e-bikes)	1	0
We have to stop burning for our energy. So things will not be a 1 for 1 exchange. We have to adapt	0	0
Yes, makes sense but needs more incentives to encourage buying EV for personal use.	0	0

What are other actions the County could take to decarbonize on-road and off-road vehicle fleets?

Total responses	*8*
Unique participants	*6*

Responses:	*Upvotes*	*Downvotes*
Develop strategies to alleviate range anxiety as a factor preventing drivers to switch to EV.	0	0
Incentives for farmers to switch to electric	0	0
Convert The county fleets to Hydrogen and Bio-fuels	1	2
Incentives for small landscaping businesses to switch to electric equipment.	3	1
implementing a city-wide electric vehicle strategy to accelerate EV adoption, including electric bicycles, that focuses on the barriers to ownership and charging for residents within low income communities	2	1
Use wind and solar to create hydrogen power. Carlsbad would be a perfect place	1	0
Electrifying 100% of the county-owned fleet, including all heavy duty and emergency response vehicles by 2030.	2	0
Tax gas and large vehicles	1	1

If any alternative modes of transportation were readily available to you, how likely would you be to use them?

Total responses	*12*
Unique participants	*16*

Responses:	*Count*	*Percent*
Very likely	7	58.33
Somewhat likely	2	16.67
Somewhat unlikely	0	0
Very unlikely	3	25

Which measure would you most like to see implemented? *Total responses* *13*

Responses:	Count	Percent
	Unique participants	*13*
Reduce miles traveled in car by County employees	3	23.08
Improve County roads so they're more user-friendly for bikes, pedestrians, etc.	4	30.77
Reduce miles traveled in car in the unincorporated area from new development	4	30.77
Support walking, biking, transit, ridehailing, and carsharing in the unincorporated area	2	15.38

Of the strategies discussed this evening, which is the most exciting to you?

Total responses 12
Unique participants 12

Responses:	Count	Percent
region: other	0	0
region: Decarbonize on-road and off-road vehicle fleet	5	41.67
region: Shift towards alternative modes of transportation	5	41.67
region: Improve traffic efficiency	2	16.67

Are there any other Built Environment and Transportation strategies, measures, or actions the County should consider?

Total responses 16
Unique participants 9

Public Transportation:
Make public transportation free
Monorail to airport
Free or very cheap public transportation. EV shuttles at beaches, etc.
Enhance public transportation in unincorporated area. Why can't we create our own?
There wasn't enough public transit in these measures
Multimodal or Infrastructure Changes:
develop a Bicycle Master Plan, a Pedestrian Master Plan, an Active Transportation Plan, or updating an existing biking and walking plans with robust measures and goals
amend local regulations and policies to allow for wider sidewalks and the use of setbacks for public spaces, and/or implement temporary and permanent car-free zones/zero emission zones.
Develop a Mobility Action Plan (or similar plan) outlining all of the strategies needed to achieve mode shift targets
Set aggressive and specific VMT reduction and mode shift targets for biking, walking, and transit. For example, the City of San Diego just adopted a CAP with a citywide 50% mode shift target for biking, walking, and transit
Change building code to remove requirements for parking spots
Are there strategies for decarbonizing cross-border transit/vehicle use? (maybe that is beyond the County's jurisdiction)
Equity Considerations:

emphasizing funding in grants for low-income communities to shift vehicles, incentivizing small businesses, more access to public transit, green jobs near us, and fixing County road infrastructure
Not punishing the poor through VMT and Idoling fines and fees.
How can we encourage sustainability in existing development, not just new development?
Electric Vehicles:
Provide EV charging infrastructure for those living in apartments.
EV charging and solar for multi unit housing. Creative incentives for landlords and management companies. Also use malls, box stores, etc as micro grids with solar on roofs and parking lots

Given what we just discussed, which co-benefits are important to you? Select all that apply

Total responses 82
Unique participants 12

***Responses*:**	*Count*	*Percent*
Improve community health	6	7.32
Conserve farmland	4	4.88
Save money on utility bills	4	4.88
Save public tax dollars	3	3.66
Improve air quality	11	13.41
Increase energy security/resilience	7	8.54
Conserve water	11	13.41
Conserve habitat	9	10.98
Create green jobs	8	9.76
Reduce noise	0	0
Promote environmental and social justice	7	8.54
Improve access to electric vehicles	5	6.1
Improve walking, biking, rolling, and transit options	7	8.54

Given the following list, what other criteria are important to you when evaluating measures? Rank the following: support co-benefits; support equity and environmental justice; reduce GHG emissions

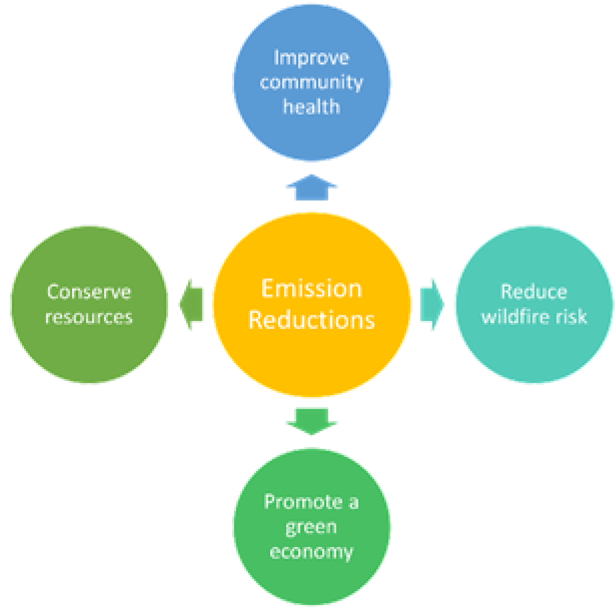
Total responses 11
Unique participants 11

quickly; reduce costs to residents and businesses; save taxpayer money

***Responses*:**	*Rank*
Support co-benefits	3
Support equity and environmental justice	2
Reduce GHG emissions quickly	1
Reduce costs to residents and businesses	4
Save taxpayer money	5

Co-Benefits Workshop
San Diego County Climate Action Plan Update

Tuesday March 21, 2023
6:00 p.m.
Zoom



Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting intentional engagement centered on climate co-benefits.

On Tuesday March 21, 2023, County staff held a virtual public workshop to discuss co-benefits associated with the County's CAP Update efforts. In advance of the meeting, staff promoted the event through e-blasts, social media posts, and direct emails to relevant and interested stakeholders. During the event, 34 participants joined representing environmental, economic, equity, and community organizations as well as individuals. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:

- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Explain how the CAP Update intersects with and engages with other County efforts and departments such as the Office of Sustainability and Environmental Justice and the Office of Equity and Racial Justice.
- Obtain input to help develop the CAP Update definition for co-benefits.
- Share information about how input on co-benefits will be showcased in the CAP Update and be provided to decision makers for their consideration.

Format
At the virtual meeting, community members participated in a staff-led presentation and polling questions along with staff facilitated breakout rooms. Throughout the workshop, participants were invited to share their perspectives through the chat, polls, Q&A feature, and an open discussion.

Simultaneous interpretation was available for attendees whose primary language is Spanish. Registrants could also request the presentation be interpreted in the other 7 threshold languages prior to the workshop. The meeting materials were also offered in Spanish and a breakout room for Spanish speakers was also made available and facilitated by a staff person who is fluent in Spanish.

Major Themes
Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- Ensuring the unique interests of the different unincorporated communities are reflected in the feedback and the CAP Update document.
- Continuing to coordinate across different County initiatives such as the CAP Update and the integrated Regional Decarbonization Framework.
- Offering additional opportunities to provide input on the topics discussed at the workshop.

Co-Benefits Definition

Participants were divided into five breakout rooms, with staff as facilitators, and prompted to develop a short definition of co-benefits for each breakout room. Prompts to help the discussion included, "If you were having coffee with your neighbor, how would you explain co-benefits to them?" and "When was the last time you walked down the road and saw something that resonated as a co-benefit for you?"

Definitions from each breakout room are reflected below, with main and/or overlapping themes underlined.

Breakout Room #1: Climate actions result in important and new community, public health, and other benefits that go above and beyond greenhouse gas emissions reductions.	Breakout Room #2: Holistic approach to climate action that result not only in greenhouse gas reduction, but the creation of careers and the protection and conservation of the unincorporated San Diego County's beautiful open spaces.
Breakout Room #3: Positive holistic effects from climate action that align with other County efforts/initiatives.	Breakout Room #4: Benefits our region and people through the CAP measures that will help to create green jobs, sustainability and equity, agriculture, cost savings and resilience.
Breakout Room #5: Interdependence of additional positive outcomes from meeting objectives that are equitably accessed, received, and provided.	

While the rest of the workshop progressed, staff drafted a working definition based on the findings from the breakout room, which was shared later in the workshop and is as follows:

> *Holistic benefits for our region and people that create healthy, resilient, and equitable communities and economies through climate action.*

Co-Benefits Tool

Staff also shared information about a tool that is being developed to analyze stakeholder feedback to determine which co-benefits are most valued across the community. The tool will offer a way to present community interest in the actions included in the CAP Update and will be presented to decision makers alongside information on GHG emissions reductions, cost, timeline, etc. to help them in determining which climate actions to prioritize.

Poll Responses

Staff asked 3 questions throughout the workshop, and a total of 27 workshop participants responded.

For the first question, staff asked participants to share what comes to mind when they hear the term, "co-benefits." This created a wordcloud with 63 total responses from 24 participants. The wordcloud is shown below and indicated that "jobs," "community," and "health" were the most common responses. Collectively other themes rose to the top as indicated in the table below.

When you hear the term, "co-benefits" what comes to mind? *Total responses* 63
Unique participants *24*

***Responses*:**	*Count*
Jobs/Union jobs	13
Health	10
Community	9
Wildlife/Trees/Green	8
Clean Energy	6
Win-Win	4
Misc.	4
Equity	4
Holistic/Universal	3
In Addition to GHGs	2

For the second question, staff asked, from a list of four definitions, which one was closest to the participants definition of co-benefits.

Total responses *25*

Which of these definitions are closest to your definition of co-benefits? *Unique participants* *25*

***Responses*:**	*Count*
"Positive outcomes from action that are not directly tied to climate change."	2
"Benefits that accrue as a side effect of a targeted policy."	5
"All of the positive outcomes associated with multiple, simultaneous emission reductions."	4
"The added benefits we get when we act to control climate change, above and beyond the direct benefits of a more stable climate."	14

For the third, and final question, staff asked which co-benefits were most important to participants.

Of the co-benefits listed, which ones matter to you most? Select all that apply. *Total responses* *171* *Unique participants* *22*

***Responses*:**	*Count*	*Percent*
Conserving land	9	41%
Reducing wildfire risk	10	45%
Conserving water	7	32%
Promoting a green economy	14	64%
Reducing GHG emissions quickly	15	68%
Reducing waste	11	50%
Increasing energy reliability	5	23%
Improving walking, biking, rolling, and transit options	12	55%
Improving community health e.g., reducing noise, increasing trees	8	36%
Saving taxpayer money	5	23%
Supporting community-driven projects	5	23%
Improving air quality	14	64%
Avoiding extra costs to the public	3	14%
Using fewer fossil fuels	10	45%
Saving money on utility bills	8	36%
Expanding green workforce training	10	45%
Prioritizing community most at-risk to climate change	13	59%
Improving access to clean technology e.g., EVs	12	55%

Spring General Update Workshop
San Diego County Climate Action Plan Update

Wednesday, May 24, 2023
6:00 p.m.
Zoom

Introduction
As part of the public involvement process for the **Climate Action Plan Update** (CAP Update), the County of San Diego (County) is conducting outreach and engagement to keep stakeholders aware of progress made on the CAP Update and continue to provide opportunities to receive feedback.

On Wednesday, May 24, 2023, County staff held a virtual public workshop to discuss CAP Update measures, implementation components, and timeline. In advance of the meeting, staff promoted the event through e-blasts and social media posts. During the event, 26 participants joined representing residents of the unincorporated area, representative of environmental groups, representatives of industry groups, and staff from other local jurisdictions or consultant firms. This summary documents meeting objectives and format, how input was solicited, and what was learned from the participants.

Objectives
The meeting was organized and conducted to accomplish the following objectives:
- Create a comfortable, engaging environment where all participants have an opportunity to provide meaningful input and share concerns.
- Explain how the CAP Update will be organized and what will be included.
- Share information on the potential measures to be included in the CAP Update.
- Begin conversations and solicit feedback around implementation of the CAP.

Format
At the virtual meeting, community members participated in a staff-led presentation and polling questions along with staff facilitated breakout rooms. Throughout the workshop, participants were invited to share their perspectives through the chat, polls, Q&A feature, and an open discussion.
Simultaneous interpretation was available for attendees whose primary language is Spanish. Registrants could also request the presentation be interpreted in the other 7 threshold languages prior to the workshop. The meeting materials were also offered in Spanish and a breakout room for Spanish speakers was also made available.

Major Themes
Major themes common to all the input received from participants are listed below. The ordering does not reflect importance or frequency.

- It's important to coordinate with and leverage other efforts happening around the region.
- The County needs to take swift action to address climate change and be compliant with existing State laws and regulations.

Breakout Rooms
Staff facilitated 5 breakout rooms, 1 for each emissions reduction sector twice around to give participants an opportunity to provide input on 2 sectors since many individuals have multiple interests or areas of expertise. The main prompt for the breakout rooms were, "What would these measures look like in your community?" Themes from the breakout rooms are highlighted below.

Energy	Built Environment and Transportation	Agriculture and Conservation
• A regional analyses of natural gas infrastructure is needed. • Make sure labor organizations are involved. • Consider energy as a just and equitable resource/transition.	• Expanded access to safe active transportation opportunities in village centers, e.g., sidewalks, crosswalks, and bikeways. • Since most emissions come from transportation, the County should do all it can to reduce emissions from this sector.	• Should transition away from focus on planting trees to instead maintaining trees and making sure they are supported, especially in the first 3 years of life. • Expand existing residential tree requirement to include multi-family residential developments.

Water and Wastewater	Solid Waste
• How the County CAP connects to water issues associated with the border. • Emphasized the delicate topic of water in the region.	• Interested in learning more about partnerships with private industries. • Interested in learning more about how the County's CAP can relate to other CAPs in the region.

Poll Responses
Staff asked 5 questions throughout the workshop, and a total of 14 workshop participants responded.
For the first question, staff asked participants to identify themselves.

I am a...

Total responses 9
Unique participants 9

***Responses*:**	*Count*
Resident of the unincorporated county	2
Representative of an environmental group	1
Representative of an industry group (e.g., labor, building, etc.)	2
Representative of a community-based organization	0

County employee	0
Other (e.g., local jurisdiction staff, consultant staff, etc.)	4

For the second question, staff asked participants to identify which of the shared measures components was most important to you.

Which of the measure components is most important to you?

Total responses 6
Unique participants 6

Responses:	*Count*
Timeline	1
GHG Emissions Reductions	3
Cost	0
Implementing Department	0
Equity-Based Outcomes	2
Co-Benefits	0

For the third question, staff asked participants to select two of the five measure sectors that are of most interest to them.

Which of the following sectors MOST interest you? Choose two.

Total responses 18
Unique participants 9

Responses:	*Count*	*Percent*
Solid Waste	1	5.56%
Energy	7	38.89%
Agriculture and Conservation	3	16.67%
Water and Wastewater	0	0%
Built Environment and Transportation	7	38.89%

The fourth and fifth questions were tied to the previous workshop staff hosted on co-benefits. During that workshop, participants were asked to co-create a definition of co-benefits. During this Spring Overview workshop, the final draft definition was presented to get additional input and suggestions for how to edit it.

"Holistic benefits for our region and people that create healthy, resilient, and equitable communities and economies through clima action." Do you think this definition accurate describes co-benefits?

Total responses 6
Unique participants 6

Responses:	*Count*	*Percent*
Completely accurate	0	0%
Mostly accurate	5	83.33%
Somewhat accurate	0	0%

Slightly accurate	1	16.67%
Not accurate at all	0	0%

What elements of the definition do you really like or think we need to change?	***Responses*:**
The definition covers up the extreme danger we face.	
Since we are probably going to end most life, it is foolish to talk about co-benefits. Extinction is overwhelming. Nothing is worse than starving to death.	
If I could suggest to include calling out the intersectionality of these elements, so that we aren't looking at them linear, and instead intersecting one another. You kind of get there with the world "holistic" but for better integration of equity, I would add the word intersectionality.	
Add in: anti-racist communities	
Equitable distribution is very important	
Use more common language	
"and economies" feels a bit awkward - why is this included?	

Appendix 02

Co-Benefits Evaluation Tool

Table of Contents

Introduction

While reducing greenhouse gas (GHG) emissions is the main objective of the County of San Diego's (County's) Climate Action Plan (CAP), secondary or related benefits, called "co-benefits" are important to consider for CAP measure prioritization and implementation. As discussed in Chapter 4, co-benefits are holistic benefits for our region and people that create healthy, resilient, and equitable communities and economic opportunities through climate action. These co-benefits can range from secondary environmental and public health benefits (e.g., improved air quality or increased mobility options) to economic benefits (e.g., increased green careers or savings on utility bills).

Co-benefits are a key part of CAP measure prioritization because they often define the positive outcomes community members directly experience through measure implementation. Reducing GHG emissions is integral to limiting the greater impacts of climate change over time, but creating positive co-benefits can more immediately and directly improve the lives, health, and well-being of our community members.

Co-Benefit Evaluation Tool Development

To support CAP measure prioritization, "co-benefit scores" were generated through the County's Co-Benefit Evaluation Tool (evaluation tool). This evaluation tool incorporates community feedback received through the CAP Survey (referenced in Chapter 2), community outreach events, and public workshops to determine the co-benefits most important to stakeholders. The evaluation tool is then used to show which CAP measures would have the greatest impact on co-benefits most important to stakeholders and assigns co-benefit scores that can be used to inform measure implementation and funding.

The evaluation tool was created by County staff based on acceptable methodologies and standard industry practice of other evaluation tools. This included the Climate Action Prioritization (CLIMACT Prio) tool, created by researchers at the Institute for Housing and Urban Development at Erasmus University Rotterdam to rank potential climate actions according to GHG impact and stakeholder priority, and the San Diego Association of Government's (SANDAG's) Prioritization Tool Guidebook, developed to support a range of planning processes for local governments that require identifying preferred strategies.

Definitions

The evaluation tool creates individual "weighted co-benefit scores" for every co-benefit, measure, and action. This is done through an evaluation of each CAP action's potential impact to an individual co-benefit, adjusting these scores to reflect stakeholder values, and generating a weighted score for each individual co-benefit that can be summarized into strategic initiative scores and overall co-benefit scores. The following terminology is used throughout this document:

CAP Actions	The CAP establishes 21 measures the County will implement to achieve GHG reduction targets. Each measure includes one or more "actions" that outline the steps the County will carry out to achieve measure implementation. Actions that are quantifiable (i.e., results in GHG emission reductions that can be estimated) are included within the

	evaluation tool and notated by sector where: T = Built Environment and Transportation; E = Energy; SW = Solid Waste; W = Water and Wastewater; and A = Agriculture and Conservation.
Co-Benefit Scores	The score (on a scale of 0 to 3) identifying the potential positive impact a CAP action will have on a specific co-benefit. For example, a CAP action to preserve land has a direct positive impact (or 3) on the co-benefit, "conserving land."
Stakeholder Weight or Stakeholder Value	The weight given to adjust an individual co-benefit score based on stakeholder feedback gathered through the CAP survey and other public workshops. Co-benefits that are more important to stakeholders have a greater weight. Weight is used to adjust co-benefit scores to "lift" the potential prioritization of CAP measures and actions with the greatest positive impact on co-benefits stakeholders value the most.
Weighted Co-Benefit Scores	The adjusted co-benefit score reflective of stakeholder weight, normalized to a 0 to 3 scale.
Strategic Initiative Scores	A summary of weighted co-benefit scores associated with each of the five County strategic initiatives.
Community Priority Scores	A summary of strategic initiative scores to present a full co-benefit score, reflective of all co-benefits, for each CAP measure. Scores are presented as on a scale from 0 to 10.

Evaluation Process

The process to evaluate measure co-benefits scores and determine which measures best support stakeholder desired outcomes began with the development and collection of measure and stakeholder inputs. Measure inputs included a complete list of CAP measures and actions, a complete list of co-benefits to be used for evaluation, and individual scores assigned for each measure's impact to individual co-benefits. Stakeholder inputs included a complete tabulation of stakeholder input on co-benefits from the CAP Survey, community outreach events, and public workshops.

Measure and stakeholder inputs were combined by weighting each co-benefit based on how important it was to all stakeholders. This weighting activity adjusts all co-benefits scores to boost the scores of those co-benefits most valuable to stakeholders. Additional information on the outreach efforts and survey responses received are provided in Chapter 2.

Using the County's Strategic Initiatives, weighted co-benefit scores were combined to create strategic initiative scores. These scores summarized the impact of each measure on co-benefits specific to one of the five strategic initiative categories. The five strategic initiative scores were then added to generate a community priority score.

A high-level review of this process is shown in Figure 1, and additional details for each process step are provided in the following sections.

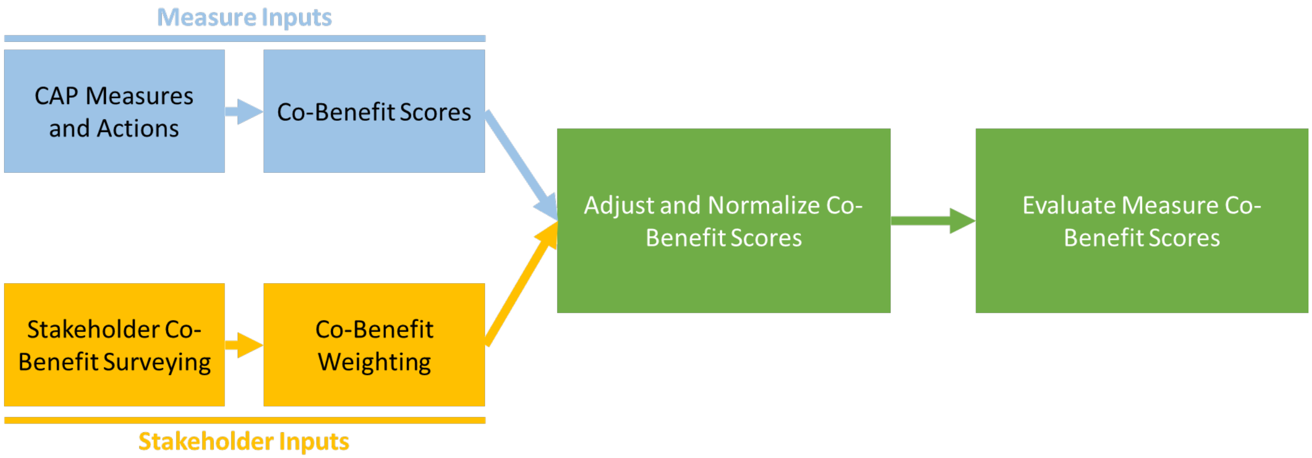


Figure 1: Co-Benefit Evaluation Tool Process Diagram

Co-Benefits

As described in Chapter 2, a list of 18 co-benefits was developed based on feedback received during outreach efforts. These co-benefits were grouped into five categories that align with the County's Strategic Initiatives. A summary of the strategic initiatives, their alignment with the CAP, and associated co-benefits is shown in Table 1: Strategic Initiative Co-Benefit Groupings.

Table 1: Strategic Initiative Co-Benefit Groupings

Co-Benefit	CAP Alignment	Strategic Initiative Alignment
1. Conserving land 2. Conserving water 3. Using fewer fossil fuels 4. Reducing waste	Addressing climate change through preserving the environment and developing innovative policies and programs.	Sustainability
5. Improving community health e.g., reducing noise, increasing trees 6. Improving walking, biking, rolling, and transit options 7. Improving air quality 8. Improving access to clean technology e.g., EVs	Reducing health disparities by improving the built environment.	Equity

Co-Benefit	CAP Alignment	Strategic Initiative Alignment
9. Saving taxpayer money 10. Promoting a green economy 11. Saving money on utility bills 12. Expanding green workforce training	Providing educational, training, and other opportunities to expand access to high-road green jobs and the green economy.	Empower
13. Reducing wildfire risk 14. Avoiding extra costs to the public 15. Increasing energy reliability	Supporting and enabling community engagement and reducing climate-related vulnerabilities to improve quality of life.	Community
16. Supporting community-driven projects 17. Reducing GHG emissions quickly 18. Prioritizing communities most at-risk to climate change	Advancing environmental and social justice through targeted universalism (i.e., setting universal goals and using targeted processes to achieve those goals) which elevates and responds to frontline communities and their needs first.	Justice

Co-Benefit Scores

Every action for which the County is estimating GHG emissions was evaluated to determine the relative impact of each action on having a positive impact on each of the 18 co-benefits. Only actions with associated emissions reductions were analyzed because they have associated implementation programs to achieve reductions identified in the CAP. Supporting "Path to Net Zero" actions were considered in the evaluation of these actions if integral to full action implementation. In total, co-benefit scores were assigned for 34 quantified CAP actions.

The potential positive impact a GHG reduction measures or action has on a co-benefit is rated on a scale from 0 to 3, where 0 means the strategy impact neutral or no positive impact and 3 means the strategy will have a direct positive impact. A summary of the criteria used to score co-benefits is provided in Table 2.

Table 2: Co-Benefit Scoring Criteria

Co-Benefit Rating	Definition
0	Action will have either no impact on the co-benefit or no *positive* impact on the co-benefit.
1	The action *may* result in a positive impact to the co-benefit; however, these positive impacts could occur regardless of action implementation. This includes actions that would support, but only nominally impact, upstream/downstream activities.
2	Implementation of the action will have an indirect positive impact on the co-benefit that may not occur without action implementation. Positive co-benefit impacts will occur from subsequent activities influenced by the action.
3	Implementation of the action will have a direct positive impact on the co-benefit.

Co-benefit scores were assigned for each individual action by County staff based on best practice research and literature review, and evaluation of any known existing implementation efforts. Best practice research and literature review included: community and stakeholder feedback on co-benefits; other recently adopted Climate Action Plans; scoring criteria used in other evaluation tools (e.g., CLIMACT Prio tool); and recommended assessment methodologies from State and international sources (e.g., California Climate Investments Co-Benefit Assessment Methodologies). Through a review of each individual action, staff assigned 18 individual co-benefit ratings and included rationales for each rating. Examples of how co-benefit ratings were determined include:

- A 0 was assigned to Action T-3.1, “Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area,” for the co-benefit, “conserving water” because it will have no impact on this co-benefit.
- A 1 was assigned to Action W-1.1, “Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations,” for the co-benefit “improving access to clean technology” because, while having no direct impact on improving access to clean technology for residents and consumers, it could result in greater investment and future access improvements to related technology.
- A 2 was assigned to Action A-2.1, ” Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities,” for the co-benefit, “improving walking, biking, rolling, and transit options” because research has shown that more shade is likely to make outdoor activities such as biking and walking more accessible by providing shading or reduced traffic speeds, but those outcomes are not guaranteed.
- A 3 was assigned to Action SW-2.1, ” Achieve zero waste within the unincorporated area,” for the co-benefit “reducing waste” because it would directly reduce waste in the unincorporated area.

The completed co-benefit scoring is provided in Table 3, and the score and staff score explanations are provided in Attachment A.

Table 3: CAP Action Co-Benefit Scores

Action	Co-Benefits																	
	Conserving land	Conserving water	Using fewer fossil fuels	Reducing waste	Improving community health	Improving walking, biking, rolling, and transit options	Improving air quality	Improving access to clean technology	Saving the taxpayer money	Promoting a green economy	Saving money on utility bills	Expanding green workforce training	Reducing wildfire risk	Avoiding extra costs to the public	Increasing energy reliability	Supporting community-driven projects	Reducing GHG emissions quickly	Prioritizing communities most at-risk to climate change
A-1.1	2	1	1	1	3	1	3	0	0	0	0	2	3	0	0	2	2	0
A-1.2	1	1	1	0	3	2	3	0	0	1	2	1	2	3	0	3	2	3
A-2.1	1	0	1	0	3	1	3	0	0	1	3	1	2	0	0	0	2	1
A-2.2	3	1	0	1	2	0	1	1	0	2	0	1	1	0	0	1	2	0
A-3.1	2	2	2	2	2	0	2	2	0	3	1	2	1	3	0	2	2	2
A-4.1	0	0	3	0	1	0	3	3	0	3	0	2	0	2	0	1	2	2
A-5.1	0	0	3	0	1	0	1	1	1	2	0	1	0	0	1	0	3	0
E-1.1	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-2.1	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-2.2	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-3.1	0	0	1	0	1	0	3	3	0	3	3	2	0	3	1	1	2	1
E-3.2	0	0	1	0	1	0	3	3	0	3	2	0	0	2	1	2	3	1
E-3.3	0	0	1	3	0	0	2	1	0	2	0	2	0	0	1	0	3	0
SW-1.1	0	0	1	3	1	0	2	1	0	2	0	2	0	0	1	2	1	0
SW-2.1	0	0	1	0	2	0	3	1	0	2	0	1	0	0	1	0	3	0
SW-3.1	0	0	1	0	2	0	3	2	0	2	0	1	0	0	1	0	1	0
SW-4.1	0	0	3	0	2	0	3	2	1	2	0	1	0	0	0	0	3	0
T-1.1	0	0	3	0	2	0	3	2	1	2	0	1	0	0	0	0	3	0
T-1.2	0	0	3	0	2	0	3	3	0	3	0	2	0	3	0	1	2	2

T-2.1	0	0	3	0	2	0	3	3	0	3	0	2	0	0	0	1	3	0
T-2.2	0	0	3	0	2	0	3	3	1	3	0	3	0	2	1	3	3	3
T-3.1	0	0	3	0	1	2	2	1	0	1	0	0	0	0	0	0	2	0
T-4.1	0	0	3	0	1	2	2	1	0	1	0	0	0	0	0	0	2	0
T-4.2	1	0	1	0	3	3	2	1	0	1	0	0	1	1	0	3	1	2
T-5.1	0	0	0	0	3	3	2	1	0	0	0	0	0	1	0	2	1	2
T-5.2	0	0	1	0	3	3	2	1	0	2	0	0	0	3	0	2	1	3
T-6.1	1	0	3	0	2	3	3	1	3	2	0	2	1	1	0	2	1	3
T-6.2	0	0	3	0	3	3	3	2	0	2	0	2	0	1	0	2	1	2
T-6.3	0	3	2	0	1	0	1	1	1	2	0	1	1	0	0	1	2	0
W-1.1	0	3	2	0	1	0	1	2	0	3	3	2	1	0	0	0	2	0
W-2.1	0	3	2	0	1	0	1	2	0	3	3	2	1	0	0	0	2	0
W-2.2	0	3	2	0	1	0	1	1	0	2	3	1	0	3	0	1	1	1
W-2.3	0	3	2	0	1	0	1	1	0	2	3	1	1	3	0	2	1	1
W-2.4	0	3	1	0	1	0	0	2	0	3	0	2	0	1	0	1	3	3
W-3.1	2	1	1	1	3	1	3	0	0	0	0	2	3	0	0	2	2	0

Stakeholder Feedback and Survey

Throughout the development of the CAP, community members were asked to participate in a multi-platform survey that included a question asking respondents to identify which of the 18 co-benefits were most important to them. There was no limitation on the number of co-benefits respondents could select (i.e., they could select all co-benefits were important to them if they chose). The survey was available online in all eight County-identified threshold languages (Arabic, Chinese, Farsi/Persian, Korean, Spanish, Somali, Tagalog, and Vietnamese) and as a hard copy, and access to the survey was advertised through all CAP Update community engagement activities including general workshops, community-specific meetings and workshops, virtual workshops, e-blasts, and social media posts. Additional information on the survey including questions, distribution methods, and results are provided in Chapter 2 and Appendix 1.

The survey provided a picture of what co-benefits are most important to stakeholders. This communitywide valuation of co-benefits was then used to “weight” each measure’s co-benefit score. Thus, co-benefits that were most frequently selected across all stakeholders were given more weight in our evaluation to determine which measures would best achieve outcomes that our stakeholders value.

All individual stakeholder survey responses were weighted equally; thus, no individual respondent or groups were given priority in co-benefit weights. This practice is intended to represent a democratic process in defining which co-benefits is most important to stakeholders at-large, in alignment with procedural equity associated with broad community engagement.

Co-benefit weights were set at a scale between 1.0 and 2.0, where the co-benefit with the fewest selections was weighted at 1.0 and the co-benefit with the most selections was weighted at 2.0. By using this scale, no co-benefit scores were reduced as a result of weighting and were only increased to reflect community values. All co-benefits received a weight between 1.0 and 2.0 based on the number of selections in comparison to the minimum and maximum selections. A tabulation of co-benefit selections and the associated weight is shown in Table 4.

Table 4: Stakeholder Co-Benefit Survey Summary and Weighting

Strategic Initiative	Co-Benefit	Total Selections	Weight[1]
Sustainability	Conserving land	460	1.90
	Conserving water	494	2.00
	Using fewer fossil fuels	243	1.23
	Reducing waste	298	1.40
Equity	Improving community health	430	1.80
	Improving walking, biking, rolling, and transit options	382	1.66
	Improving air quality	411	1.75
	Improving access to clean technology	295	1.39
Empower	Saving the taxpayer money	318	1.46
	Promoting a green economy	333	1.51

Strategic Initiative	Co-Benefit	Total Selections	Weight[1]
	Saving money on utility bills	458	1.89
	Expanding green workforce training	168	1.00
Community	Reducing wildfire risk	409	1.74
	Avoiding extra costs to the public	293	1.38
	Increasing energy reliability	334	1.51
Justice	Supporting community-driven projects	210	1.13
	Reducing GHG emissions quickly	180	1.04
	Prioritizing communities most at-risk to climate change	294	1.39
Notes: [1] Weights shown are rounded to the nearest one-hundredth. Rounding was not applied within the Co-Benefit Evaluation Tool.			

As shown in Table 4, the individual co-benefits that were identified as having the greatest value to the community were: conserving water; conserving land; improving community health; and improving air quality. On average, co-benefits associated with the Equity and Sustainability Initiatives were identified as having the greatest value to the community. Measures with greater positive impacts to co-benefits associated with Equity and Sustainability are anticipated to have higher community priority score.

Co-Benefit Evaluation Tool

Summary scores were generated for each CAP measure to show how each measure would positively impact co-benefits. Measures with higher scores typically reflect greater positive impacts on co-benefits that were identified as most valuable to community members. Summary scores from the evaluation tool process were summarized based on Strategic Initiatives, providing final "Strategic Initiative Scores" and "Community Priority Scores." The process of calculating these summary scores included application of stakeholder co-benefit weights, normalizing co-benefit scores, and averaging normalized co-benefit scores across strategic initiative categories.

Weighted and Normalized Scoring

Individual co-benefits scores for all measures were multiplied by stakeholder weights for each co-benefit. After applying co-benefit weights, all scores were normalized to remain consistent with the 0 to 3 scale used initially to assign co-benefit scores. Through normalization, the maximum weighted score was scaled to equal 3, while all other scores were scaled consistent with this adjustment. In this use, the normalization process was done to provide a direct comparison of weighted scores to initial co-benefit scores.

In application, normalized scores were calculated using the following equation where "X" is the co-benefit scores, and the range of normalized scores is set between 0 and 3:

$$X_{Normalized} = \frac{(X_{Weighted} - X_{Min})(0-3)}{(X_{Max} - X_{Min})}$$

Summary Scores

After normalization, each collection of co-benefits was summarized into a single score for associated Strategic Initiatives (see Table 1). This process was followed for every CAP action. In some instances, a single CAP measure may have multiple associated actions that were included within the evaluation tool. For these measures, the Strategic Initiative score reflects an average score of the associated actions. Due to adjustments made during co-benefit weighting, the Strategic Initiative scores for each measure are greater for initiatives most valued by the community. The output for all Strategic Initiative Summary Scores is provided in Attachment B. For comparison purposes across measures, each measure's score for a particular Strategic Initiative is shown in Table 5 through Table 9 in comparison to the maximum score for that Strategic Initiative (represented as percent of maximum score). The tables values shown below are represented in the CAP document (see the Co-Benefit graphic for each CAP measure in Chapter 4) based on the "quadrant" in which they fall (i.e., 0-25%, 25-50%, 50-75%, 75-100%) on a qualitative scale between Low and High.

Sustainability Strategic Initiative Scores

The summary scores for all measures under the Sustainability Strategic Initiative are shown in Table 5. This strategic initiative grouping is a summary of four co-benefits: conserving land; conserving water; using fewer fossil fuels; and reducing waste.

Table 5: Sustainability Strategic Initiative Scores

Maximum Score:	1.63	
Measure		**Score (% of maximum)**
A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	100%
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	70%
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	65%
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	65%
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	65%
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	55%
SW-2	Achieve zero waste within the unincorporated area.	42%
SW-1	Achieve Zero Waste in County Operations.	42%
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	32%

T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	28%
A-5	Reduce GHG emissions from agricultural operations.	28%
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	28%
T-1	Reduce fleet and small equipment emissions in County Operations.	28%
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	28%
T-4	Reduce emissions from County employee commutes.	28%
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	27%
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	19%
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	13%
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	12%
SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	9%
SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	9%

Equity Strategic Initiative Scores

The summary scores for all measures under the Equity Strategic Initiative are shown in Table 6. This strategic initiative grouping is a summary of four co-benefits: improving community health; improving walking, biking, rolling, and transit options; improving air quality; and improving access to clean technology.

Table 6: Equity Strategic Initiative Scores

Maximum Score:	2.04	
Measure		**Score (% of maximum)**
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	100%
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	94%
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	81%
T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	80%
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	80%
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	76%
T-1	Reduce fleet and small equipment emissions in County Operations.	71%

SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	71%
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	70%
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	69%
A-5	Reduce GHG emissions from agricultural operations.	69%
SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	63%
T-4	Reduce emissions from County employee commutes.	61%
A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	61%
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	41%
SW-2	Achieve zero waste within the unincorporated area.	41%
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	35%
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	30%
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	30%
SW-1	Achieve Zero Waste in County Operations.	30%
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	28%

Empower Strategic Initiative Scores

The summary scores for all measures under the Empower Strategic Initiative are shown in Table 7. This strategic initiative grouping is a summary of four co-benefits: saving taxpayer money; promoting a green economy; saving money on utility bills; and expanding green workforce training.

Table 7 Empower Strategic Initiative Scores

Maximum Score:	1.52	
Measure		**Score (% of maximum)**
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	100%
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	90%
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	89%

T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	74%
A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	69%
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	59%
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	53%
A-5	Reduce GHG emissions from agricultural operations.	53%
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	53%
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	48%
T-1	Reduce fleet and small equipment emissions in County Operations.	45%
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	45%
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	45%
SW-2	Achieve zero waste within the unincorporated area.	41%
SW-1	Achieve Zero Waste in County Operations.	41%
SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	33%
SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	33%
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	33%
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	16%
T-4	Reduce emissions from County employee commutes.	12%
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	6%

Community Strategic Initiative Scores

The summary scores for all measures under the Community Strategic Initiative are shown in Table 8. This strategic initiative grouping is a summary of three co-benefits: reducing wildfire risk; avoiding extra costs to the public; increasing energy reliability.

Table 8: Community Strategic Initiative Scores

Maximum Score:	0.98	
Measure		**Score (% of maximum)**

A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	100%
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	94%
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	89%
T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	73%
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	57%
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	56%
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	49%
A-5	Reduce GHG emissions from agricultural operations.	47%
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	38%
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	35%
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	30%
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	30%
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	26%
SW-2	Achieve zero waste within the unincorporated area.	26%
SW-1	Achieve Zero Waste in County Operations.	26%
SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	26%
SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	26%
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	23%
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0%
T-1	Reduce fleet and small equipment emissions in County Operations.	0%
T-4	Reduce emissions from County employee commutes.	0%

Justice Strategic Initiative Scores

The summary scores for all measures under the Sustainability Strategic Initiative are shown in Table 9. This strategic initiative grouping is a summary of three co-benefits: supporting community-driven projects; reducing GHG emissions quickly; and prioritizing communities most at-risk to climate change.

Table 9: Justice Strategic Initiative Scores

Maximum Score:	1.78	
Measure		**Score (% of maximum)**
T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	100%
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	79%
A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	67%
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	66%
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	62%
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	61%
A-5	Reduce GHG emissions from agricultural operations.	56%
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	48%
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	45%
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	41%
SW-2	Achieve zero waste within the unincorporated area.	31%
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	30%
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	30%
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	30%
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	29%
SW-1	Achieve Zero Waste in County Operations.	29%
SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	29%
T-1	Reduce fleet and small equipment emissions in County Operations.	29%
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	29%
T-4	Reduce emissions from County employee commutes.	19%
SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	10%

Community Priority Scores

Strategic Initiative scores for each measure were summarized into a final Community Priority Score. These scores provide the final evaluation of a measure's positive impact on all co-benefits with particular value towards those with greater impacts to co-benefits most valued to the community. Final scores are shown on a scale from 0 to 10, where 10 reflects the measure with the greatest direct impact to co-benefits most valued by the community. Community Priority Scores and qualitative ranks are shown in Table 10, and additional information, including the summary scores used to generate Community Priority Scores, is provided in Attachment B.

Table 10: CAP Measure Community Priority Scores

Measure		**Community Priority Score**
A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	10.0
T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	9.4
A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	8.3
T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	8.0
A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	7.3
E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	7.1
W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	6.9
A-5	Reduce GHG emissions from agricultural operations.	6.8
T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	6.7
W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	6.4
E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	6.2
T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	6.0
A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	5.4
W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	5.2
T-1	Reduce fleet and small equipment emissions in County Operations.	5.1
SW-2	Achieve zero waste within the unincorporated area.	4.8

SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	4.4
SW-1	Achieve Zero Waste in County Operations.	4.4
E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	4.2
SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	4.2
T-4	Reduce emissions from County employee commutes.	3.7

Evaluation Purpose and Outcomes

As described throughout this process, co-benefits are an important way for the County to understand priorities for implementing measures and actions. While all CAP measures will create a variety of co-benefits supporting the County's Strategic Initiatives, the value of each co-benefit can differ across individuals and groups within the community. The evaluation tool was created to highlight which CAP measures would have the greatest positive impact on co-benefits most valued by stakeholders at-large. The intent of the evaluation tool is not to remove measures from consideration, but rather to help prioritize the timeline and manner in which measures and actions to fund and implement.

High Score Summary

Through evaluation of co-benefits and weighting stakeholder values, the five highest scoring measures include:

1. Measure A-4: Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.
2. Measure T-3: Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.
3. Measure A-2: Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.
4. Measure T-6: Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area.
5. Measure A-1: Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.

These top five measures are reflective of the input received from stakeholders on which co-benefits are most important to them, which included: conserving water; conserving land; improving community health; and improving air quality. Measures A-4 and A-1 are key strategies to conserve land in the unincorporated area and support improved air quality, and Measure A-4 specifically would also indirectly support water conservation through improved practices. Measures T-3 and T-6 are important transportation measures to reduce emissions from gas-powered vehicles thereby improving community health and air quality. Measure A-2 would greatly improve community health in unincorporated communities and could support water conservation through improved urban area designs that reduce runoff.

Environmental Justice and Equity

As described in Chapter 2, public input is a foundation of the County's CAP. Procedural equity was an integral part of CAP Update community engagement efforts by encouraging participation from individuals and groups that may be underrepresented or underrecognized in the County's planning processes.

The Board of Supervisors direction in preparing this CAP was to develop a CAP that sets clear goals and metrics to attain environmental justice and equity. The evaluation tool, in combination with the extensive outreach and engagement efforts, are intended to achieve this vision. When paired with this outreach, procedural equity is built into the evaluation tool through each individual vote being equal within the weighting process. With over 6,000 co-benefit weighting selections included in the stakeholder weighting process, the weights are intended to reflect the broader community and remove potential skewing that could result from large organizations or more vocal individuals putting a thumb on this weighting scale.

This evaluation tool is not intended to serve as the end goal of this process, but rather set a starting point from which CAP measure implementation can occur and be informed by community values. The evaluation tool provides a metric that can be used to inform which measures achieve co-benefits most valued by stakeholders, regardless of the magnitude of GHG reductions achieved. The scoring outputs from the evaluation tool represent a procedural equity approach of creating outreach and engagement processes that are transparent, fair, and inclusive and opportunities for engagement in decision-making. These outputs provide an additional consideration when determining when and how to implement measures and actions beyond GHG reduction benefits or ease of implementation. At large, co-benefits outlined through this process provide the same benefits to all stakeholders and community members. The evaluation tool is not meant to address full equitable implementation of measures or achieve outcomes, but sets a baseline procedural component from which distributional and structural equity decisions can be informed. The outputs are complementary to the equity-based objectives identified for each measure and are the beginning point of a continuum of integrating equity into the CAP process. Additional next steps for ensuring structural and distributional equity are achieved is outlined in Appendix 1.

The evaluation tool and survey also provide a baseline metric for evaluating CAP implementation effectiveness. As CAP measures are implemented, continued co-benefit evaluation can indicate community interest towards these co-benefits and whether they are seen as being achieved through implementation. Additionally, the co-benefits provide overarching tracking metrics that can be used to quantitatively assess CAP implementation. For example, some co-benefits like saving money on utility bills or improving air quality could be used as indicators over time as broad metrics to assess overall CAP implementation.

Attachment A
CAP Action Co-Benefit Scores

Solid Waste Measures – Co-Benefit Evaluation

Strategy SW-1.1	Achieve Zero Waste in County Operations.
Action	Adopt a County Operations zero waste policy to achieve zero waste (90% diversion) by 2030.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Producing less waste means less transportation of waste/goods. Diversion away from potential fossil fuel use at processing facilities.
Reducing waste	3	Measure would directly reduce waste.
Improving community health	0	No impact.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	2	Action to reduce waste would have indirect benefit from reduce emissions from landfills and associated solid waste transportation.
Improving access to clean technology	1	streamlined processes for waste-to-energy.
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Potential to generate new jobs.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Potential to generate new jobs and associated training.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	1	Waste-to-energy processes increase energy availability.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	3	Immediate reduction in GHG emissions through diversion.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy SW-2.1	Achieve zero waste within the unincorporated county.	
Action	Update the County's Strategic Plan to Reduce Waste to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Unknown potential to reduce fossil fuel consumption associated with solid waste collection and transfer.
Reducing waste	3	Directly reduces waste generation.
Improving community health	1	Long-term impact on reduced blight and litter. May provide access to proper disposal facilities.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	2	Indirect impact through reduced waste decomposition at landfills.
Improving access to clean technology	1	Potential to increase investment in recycling or reuse technologies.
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Indirect impact supporting green jobs related to waste diversion.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirect impact supporting green jobs and associated trainings.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	1	Potential impact to waste-to-energy.
Supporting community-driven projects	2	Community support for composting, waste diversion, and circular economies
Reducing GHG emissions quickly	1	Downstream impacts but reliant on others to implement. Limited control.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy SW-3.1	Improve waste management practices at County-owned solid waste facilities to reduce emissions	
Action	Expand landfill gas systems at County-owned landfills to exceed State requirements by 5% by 2030 and 10% by 2045.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Very downstream replacement of fossil fuel use in certain activities
Reducing waste	0	No impact.
Improving community health	2	Can support reduced emission seepage in soil/water
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Directly improves air quality through fugitive emission reduction.
Improving access to clean technology	1	Potential to support increased market demand.
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Expand job opportunity through investment in facilities
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	If opportunity for job maybe more training
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	1	Barriers from utility companies, may not produce enough to create reasonable amount of energy
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	3	Direct County control over implementation.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy SW-4.1	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion
Action	Conduct a feasibility study and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% by 2045 in the incorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential to support waste-to-energy.
Reducing waste	0	No impact.
Improving community health	2	Indirect impact to reduce liter and blight.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Directly reduces fugitive emission reduction.
Improving access to clean technology	2	Incentives direct to private landfill owners
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Potential to support increased market demand.
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Minor potential change to available green workforce jobs and training.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	Incentives are for private landfills not public – keeping at 0
Increasing energy reliability	1	Potential to support energy-to-waste.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	1	No direct County control, but once in place immediate reductions
Prioritizing communities most at-risk to climate change	0	No impact.

Water and Wastewater Measures – Co-Benefit Evaluation

Strategy W-1.1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.
Action	Implement the County's Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	3	Directly conserves water.
Using fewer fossil fuels	2	Indirectly reduces fossil fuel use through reduce water conveyance.
Reducing waste	0	No impact.
Improving community health	1	County landscaping
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Reducing fossil fuels and landscaping
Improving access to clean technology	1	Building market demand
Saving the taxpayer money	1	Reduced water budget for County operations over time
Promoting a green economy	2	Indirect market influence for green products or practices.
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Potential impact to green job availability and training.
Reducing wildfire risk	1	Native/low-water landscaping
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Native Plants Board Policy
Reducing GHG emissions quickly	2	Many associated actions have already been implemented to-date.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy W-2.1	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	
Action	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 17% in the unincorporated area.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	3	Directly conserves water.
Using fewer fossil fuels	2	Indirect reduction in fossil fuel use through reduced conveyance.
Reducing waste	0	No impact.
Improving community health	1	Potential impact to potable water available which can positively benefit community health
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality by reducing dust through native plants/landscaping.
Improving access to clean technology	2	Indirectly supports clean technology markets.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green jobs and resources.
Saving money on utility bills	3	Directly saves money on utility bills.
Expanding green workforce training	2	Indirectly expands training through green job promotion.
Reducing wildfire risk	1	Potential to reduce wildfire risks associated with landscaping practices.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	2	Regulatory, but scope might be small
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy W-2.2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	
Action	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen water efficiency requirements for existing development projects with qualifying improvements.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	3	Directly conserves water.
Using fewer fossil fuels	2	Indirect reduction in fossil fuel use through reduced conveyance.
Reducing waste	0	No impact.
Improving community health	1	Potential impact to potable water available which can positively benefit community health
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality by reducing dust through native plants/landscaping.
Improving access to clean technology	2	Indirectly supports clean technology markets.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green jobs and resources.
Saving money on utility bills	3	Directly saves money on utility bills.
Expanding green workforce training	2	Indirectly expands training through green job promotion.
Reducing wildfire risk	1	Potential to reduce wildfire risks associated with landscaping practices.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	2	Regulatory, but scope might be small
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy W-2.3	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	
Action	Update the Green Building Incentive program to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	3	Directly conserves water.
Using fewer fossil fuels	2	Indirectly reduces fossil fuel use through reduced water conveyance.
Reducing waste	0	No impact.
Improving community health	1	Potential impact to potable water available which can positively benefit community health
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality through dust reduction.
Improving access to clean technology	1	Incentive, not regulatory
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Incentive, not regulatory
Saving money on utility bills	3	Direct reduction in utility bill cost.
Expanding green workforce training	1	Incentive, not regulatory
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	3	Incentive provides immediate cost savings to public.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Incentive-based as opposed to regulatory
Reducing GHG emissions quickly	1	Incentive, not regulatory
Prioritizing communities most at-risk to climate change	1	Incentives could be structured to prioritize these communities getting involved

Strategy W-2.4	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated county.	
Action	Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	3	Directly conserves water
Using fewer fossil fuels	2	Indirectly reduces fossil fuel use by reducing water conveyance.
Reducing waste	0	No impact.
Improving community health	1	Potential to improve community health through increase potable water availability.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality through dust reduction.
Improving access to clean technology	1	Incentive, not regulatory
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Incentive, not regulatory
Saving money on utility bills	3	Direct reduction in utility bill cost.
Expanding green workforce training	1	Incentive, not regulatory
Reducing wildfire risk	1	Potential to reduce wildfire risk through landscaping.
Avoiding extra costs to the public	3	Incentive provides direct cost reduction to public.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Accessible to anyone, not just those who are making home improvements
Reducing GHG emissions quickly	1	Incentive, not regulatory
Prioritizing communities most at-risk to climate change	1	Implementation potential.

Strategy W-3.1	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use in the unincorporated area	
Action	Increase wastewater treatment efficiency through the East County Advanced Water Purification Program.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	3	Directly conserves water.
Using fewer fossil fuels	1	Potential to reduce overall energy generated required to treat and convey water.
Reducing waste	0	No impact.
Improving community health	1	More access to water locally, less risk of water stress
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	0	No impact.
Improving access to clean technology	2	Indirectly promotes clean technology through increased project education/exposure.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green economy.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirectly promotes green workforce training to support green economy jobs.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	1	Potential behavior change that could reduce consumer water cost
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Potential to support broader community desires for water conservation and local water supplies.
Reducing GHG emissions quickly	3	Directly reduces GHG emissions and under County control/investment.
Prioritizing communities most at-risk to climate change	3	Communities with water issues will have local availability

Agriculture and Conservation Measures – Co-Benefit Evaluation

Strategy A-1.1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential in the unincorporated area.	
Action	Acquire 11,000 acres of conservation lands by 2030 and 1,000 acres per year thereafter to preserve land in perpetuity.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	3	Directly conserves land
Conserving water	2	Indirectly by avoiding development water use and continued ground water recharge.
Using fewer fossil fuels	2	Indirectly by avoiding development and associated fossil fuel use.
Reducing waste	2	Indirectly by avoiding development and associated waste generation.
Improving community health	3	Reducing noise and planting more trees
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Directly improves air quality.
Improving access to clean technology	0	No impact.
Saving the taxpayer money	0	No impact.
Promoting a green economy	0	No impact.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirectly through land management
Reducing wildfire risk	2	Indirectly through land management
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Directly supported by community groups.
Reducing GHG emissions quickly	2	Direct County control and immediate benefit through avoidance of future emissions
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy A-1.2	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential in the unincorporated area.
Action	Develop a Habitat Restoration Resource Management Framework for County-owned land and restore 480 acres by 2030 and 80 acres per year thereafter to increase carbon storage.

Co-Benefit	Rating	Reasoning
Conserving land	2	Already preserved land as opposed to new land conserved
Conserving water	1	Potential water conservation through restoration and groundwater recharge.
Using fewer fossil fuels	1	Potential fossil fuel use reduction through avoided development.
Reducing waste	1	Potential waste reduction through avoided development.
Improving community health	3	Direct benefit to community health through natural lands and recreation.
Improving walking, biking, rolling, and transit options	1	Potential improvement if associated with parks with trails
Improving air quality	3	Directly air quality improvement.
Improving access to clean technology	0	No impact.
Saving the taxpayer money	0	No impact.
Promoting a green economy	0	No impact.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirectly through restoration and management.
Reducing wildfire risk	3	Directly if inclusive of wildfire risk reduction actions
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Stakeholder support
Reducing GHG emissions quickly	2	Framework will include activities to increase carbon sequestration
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy A-2.1	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.
Action	Expand the County's existing tree planting initiative and implement the Equity Driven Tree Planting Program to plant 87,539 trees by 2030 and 4,150 trees per year thereafter on County property and in the unincorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	1	If planting in public-owned lands could be preserving that land
Conserving water	1	Possibility for water capture; drought tolerant plants as opposed to more water-intensive plants
Using fewer fossil fuels	1	Replacing potential use of concrete
Reducing waste	0	No impact.
Improving community health	3	Direct community health benefit.
Improving walking, biking, rolling, and transit options	2	Indirectly increases desirability to walk around.
Improving air quality	3	Direct air quality improvement.
Improving access to clean technology	0	No impact.
Saving the taxpayer money	0	No impact.
Promoting a green economy	1	Potential through associated planning and maintenance.
Saving money on utility bills	2	Indirectly through lowered utility costs by reducing urban heat island
Expanding green workforce training	1	Potential through associated maintenance activities.
Reducing wildfire risk	2	Indirectly through improvement maintenance.
Avoiding extra costs to the public	3	Direct benefit.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	3	Community support through outreach.
Reducing GHG emissions quickly	2	County control over implementation, other planning and maintenance hurdles makes benefit indirect.
Prioritizing communities most at-risk to climate change	3	Directly prioritizes at-risk communities.

Strategy A-2.2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.		
Action	Implement the County's Landscaping Ordinance to require tree planting in new single family residential development in the unincorporated area.		

Co-Benefit	Rating	Reasoning
Conserving land	1	Potential through space requirements on private lands.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential through reduced maintenance.
Reducing waste	0	No impact.
Improving community health	3	Direct benefit.
Improving walking, biking, rolling, and transit options	1	Potential through improved alternative mode comfort.
Improving air quality	3	Direct benefit.
Improving access to clean technology	0	No impact.
Saving the taxpayer money	0	No impact.
Promoting a green economy	1	Potential to increase through needed maintenance, planning, and enforcement.
Saving money on utility bills	3	Directly on homes
Expanding green workforce training	1	Potential through associated new jobs.
Reducing wildfire risk	2	Indirectly through native plants.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	2	County control for ordinance development but requires private development to implement.
Prioritizing communities most at-risk to climate change	1	Potential to benefit at-risk communities if streamlined.

Strategy A-3.1	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.
Action	Continue to implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 6,058 acres of agricultural land by 2030 and 400 acres per year thereafter.

Co-Benefit	Rating	Reasoning
Conserving land	3	Directly conserves land.
Conserving water	1	Potential to use practices that increase water retention.
Using fewer fossil fuels	0	No impact.
Reducing waste	1	Potential to use compost/mulch.
Improving community health	2	Indirectly preserves ag and food access.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential improvement contingent on operations.
Improving access to clean technology	1	Potential to connect to carbon farming
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Indirectly promotes circular economy and associated RDF policies.
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Potential to promotes circular economy and associated training.
Reducing wildfire risk	1	Potential through prescribed grazing.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	There is strong interest in maintaining current ag lands.
Reducing GHG emissions quickly	2	Direct County control.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy A-4.1	Incentivize carbon farming to expand carbon storage capacity on agricultural land and support climate-friendly farming practices in the unincorporated area.	
Action	Develop a Carbon Farming Program to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	2	Indirect through incentivizing land conservation
Conserving water	2	Indirect through land conservation and water recharge.
Using fewer fossil fuels	2	Indirect through improved management practices.
Reducing waste	2	Indirect through improved management practices.
Improving community health	2	Indirect through improved management practices.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	2	Indirect through improved management practices.
Improving access to clean technology	2	Indirect by increasing use of clean technologies.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green economy.
Saving money on utility bills	1	Potential for water retention
Expanding green workforce training	2	Indirect through green economy promotion.
Reducing wildfire risk	1	Potential through improved management practices.
Avoiding extra costs to the public	3	Direct cost reduction.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Indirectly supports other community-driven projects related to carbon sequestration.
Reducing GHG emissions quickly	2	Direct and immediate reductions through carbon sequestration.
Prioritizing communities most at-risk to climate change	2	Farmers are at-risk to climate change; increases food access.

Strategy A-5.1	Reduce greenhouse gas emissions from agricultural operations.
Action	Develop a program to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct reduction in fossil fuel use.
Reducing waste	0	No impact.
Improving community health	1	Potential to improve community health through air quality improvements.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Directly improves air quality.
Improving access to clean technology	3	Directly improves access to clean technology.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green economy.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirectly through promotion of green economy.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	2	Indirectly through incentives.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Potential support of broader community support of food access and sequestration.
Reducing GHG emissions quickly	2	Indirectly through private implementation through County incentive.
Prioritizing communities most at-risk to climate change	2	Farmers are at-risk community

Energy Measures – Co-Benefit Evaluation

Strategy E-1.1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.
Action	Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct reduction in fossil fuel use.
Reducing waste	0	No impact.
Improving community health	1	Potential community health improvement through improved
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality through reduction in energy generation needs.
Improving access to clean technology	1	Potential to improve clean technology access through construction, management, and use practices.
Saving the taxpayer money	1	Potential to save the taxpayer money through reduced operations costs.
Promoting a green economy	2	Indirectly through new practices.
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Potential to expand green workforce training through increased need for new practices.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	1	Potential to increase energy reliability by reducing operational energy demand.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	3	Reducing energy consumption directly reduces emissions.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy E-2.1	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.
Action	Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	2	Lessens future demand of fossil fuels in new development but does not directly reduce existing consumption.
Reducing waste	0	No impact.
Improving community health	3	Directly improves community health by reducing exposure to indoor pollutants.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality through reduce fuel use at end uses, but may increase fuel consumption at electricity generation sources.
Improving access to clean technology	3	Directly provides access to clean technologies required to meet all-electric.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green economy through requirement of new technologies.
Saving money on utility bills	3	Directly saves money on utility bills by reducing infrastructure needs for new construction.
Expanding green workforce training	2	Indirectly expands green workforce training through new technology and construction needs.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Community support for electrification at-large.
Reducing GHG emissions quickly	2	Action is regulatory. Scope might be small.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy E-2.2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.
Action	Increase energy efficiency and electrification in existing development in the unincorporated area by: - Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen energy efficiency requirements for existing development projects with qualifying improvements. - Adopting a Building Energy Performance Standard for commercial and multi-family residential properties. - Developing a program to incentivize building electrification and energy efficiency.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	2	Lessens future demand of fossil fuels but does not directly reduce consumption.
Reducing waste	0	No impact.
Improving community health	3	Directly improves community health by reducing exposure to indoor pollutants.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential to improve air quality through reduce fuel use at end uses, but may increase fuel consumption at electricity generation sources.
Improving access to clean technology	3	Directly provides access to clean technologies required to meet all-electric.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Directly promotes green economy through requirement of new technologies.
Saving money on utility bills	3	Directly saves money on utility bills by reducing infrastructure needs for new construction.
Expanding green workforce training	2	Indirectly expands green workforce training through new technology and construction needs.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Community support for electrification at-large.
Reducing GHG emissions quickly	2	Reductions through regulatory actions may not be immediate.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy E-3.1	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.
Action	Amend the San Diego County Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	2	Indirect through regulatory action.
Reducing waste	0	No impact.
Improving community health	3	Direct through reduced exposure to pollutants.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	1	Potential through reduced fossil fuel consumption but increased electricity demand.
Improving access to clean technology	3	Direct through new and renewable energy technology requirements.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Direct through new and renewable energy technology requirements.
Saving money on utility bills	3	Direct through reduced infrastructure costs.
Expanding green workforce training	2	Indirect through new technology and construction needs.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Potential support aligned with broader electrification efforts.
Reducing GHG emissions quickly	2	Indirect through regulatory action.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy E-3.2	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	
Action	Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential through incentivized processing of renewable energy projects.
Reducing waste	0	No impact.
Improving community health	1	Potential through incentivized processing.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Directly through increase renewable electricity generation.
Improving access to clean technology	3	Direct through increased renewable electricity facilities.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Direct through increased renewable electricity facilities.
Saving money on utility bills	3	Direct through reduced costs of non-renewable energy.
Expanding green workforce training	2	Indirect through increased need for renewable electricity service providers.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	3	Direct by lessening costs associated with permitting processes.
Increasing energy reliability	1	Potential through increased local energy generation.
Supporting community-driven projects	1	Potential associated with larger electrification support.
Reducing GHG emissions quickly	2	Indirect through regulatory process.
Prioritizing communities most at-risk to climate change	1	Potential through local energy generation.

Strategy E-3.3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated county.	
Action	Develop a program to provide 100% renewable energy from San Diego Community Power by 2030 in the unincorporated area.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential through energy generation procured by another agency.
Reducing waste	0	No impact.
Improving community health	1	Potential through energy generation procured by another agency.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct improvement of local air quality.
Improving access to clean technology	3	Direct through influence of energy generation practices.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Direct through influence of energy generation practices.
Saving money on utility bills	2	Indirect through County programming and renewable efficiency through another agency.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	2	Indirect through County programming.
Increasing energy reliability	1	Potential through local energy generation programs/projects.
Supporting community-driven projects	2	Indirect through support of local renewable energy generation and broader electrification.
Reducing GHG emissions quickly	3	Direct through immediate reductions from renewable energy generation.
Prioritizing communities most at-risk to climate change	1	Potential through focused outreach within communities most at-risk to prevent misinformation

Built Environment and Transportation Measures – Co-Benefit Evaluation

Strategy T-1.1	Reduce fleet and small equipment emissions in County Operations.	
Action	Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct impact through vehicle conversion.
Reducing waste	0	No impact.
Improving community health	2	Indirect through associated noise pollution reductions from vehicles
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct through reduced emissions from vehicles.
Improving access to clean technology	2	Indirect by supporting clean vehicle market.
Saving the taxpayer money	1	Potential through long term effect of saving money by switching to EVs
Promoting a green economy	2	Indirect through possible procurement of green equipment
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Potential through vehicle and maintenance training required.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	3	Direct through vehicle emission reductions.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy T-1.2	Reduce fleet and small equipment emissions in County Operations.	
Action	Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct reduction through fuel switching.
Reducing waste	0	No impact.
Improving community health	2	Indirect through noise reduction.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct through fuel consumption reduction.
Improving access to clean technology	2	Indirect through access to new technology through County contracting.
Saving the taxpayer money	1	Potential through reduced contractor costs.
Promoting a green economy	2	Indirect through clean technology use at County facilities.
Saving money on utility bills	0	No impact.
Expanding green workforce training	1	Potential through associated use and maintenance of clean equipment.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	3	Direct through reduce fossil fuel consumption.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy T-2.1	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	
Action	Develop a program to provide residents and businesses incentives for alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 5% by 2030.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through fuel switching.
Reducing waste	0	No impact.
Improving community health	2	Indirect through noise abatement.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct through fuel switching.
Improving access to clean technology	3	Direct through clean landscaping equipment use.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Direct through clean equipment use.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirect through use and maintenance of clean equipment.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	3	Direct through incentives.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Potential through support of electrification and community health.
Reducing GHG emissions quickly	2	Indirect through incentive program requiring participation.
Prioritizing communities most at-risk to climate change	2	Indirect through program design and existing impacts related to landscaping equipment.

Strategy T-2.2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.
Action	Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through fuel switching.
Reducing waste	0	No impact.
Improving community health	2	Indirect through noise abatement.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct through reduction in pollutant emissions from equipment.
Improving access to clean technology	3	Direct through required new technology adoption.
Saving the taxpayer money	0	No impact.
Promoting a green economy	3	Direct through required new technology adoption.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirect through maintenance and use of new technologies.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	1	Potential through community support of electrification and reduction of fossil fuel consumption.
Reducing GHG emissions quickly	3	Direct through fuel switching.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy T-3.1	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.
Action	Increase the use of electric and other zero-emission vehicles in the unincorporated area by: - Installing 2,040 publicly available electric vehicle charging stations by 2028. - Requiring the electrification of loading docks and idling reduction in new commercial and industrial development. - Amending the San Diego County Code of Regulatory Ordinances to require (Tier 2) CALGreen electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multi-family residential and non-residential construction. - Developing a program to incentivize EV purchases. - Developing a program to incentivize school bus electrification.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through fuel switching.
Reducing waste	0	No impact.
Improving community health	2	Indirect through noise abatement.
Improving walking, biking, rolling, and transit options	0	No impact.
Improving air quality	3	Direct through fuel switching.
Improving access to clean technology	3	Direct through new technology use.
Saving the taxpayer money	1	Potential through developer payment burden, other side unknown
Promoting a green economy	3	Direct through new technology use.
Saving money on utility bills	0	No impact.
Expanding green workforce training	3	Direct through new technology use and installation.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	2	Indirect through incentives.
Increasing energy reliability	1	Potential to support grid reliability.
Supporting community-driven projects	3	Direct through community support of zero-emission vehicles.
Reducing GHG emissions quickly	3	Direct through fuel switching.
Prioritizing communities most at-risk to climate change	3	Direct through known impacts of transportation pollution of at-risk communities.

Strategy T-4.1	Reduce emissions from County employee commutes.
Action	Expand County Benefit Program to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time teleworking options to reduce vehicle miles traveled from employee commutes by 40% in 2030 and 60% in 2045.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through fuel switching.
Reducing waste	0	No impact.
Improving community health	1	Potential through noise abatement and employee health.
Improving walking, biking, rolling, and transit options	2	Indirect through incentivization.
Improving air quality	2	Indirect through incentivization.
Improving access to clean technology	1	Potential through clean technology use in alternative modes (e.g., e-bikes or electric buses)
Saving the taxpayer money	0	No impact.
Promoting a green economy	1	Potential through clean technology use in alternative modes.
Saving money on utility bills	0	No impact.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	2	Indirect through incentivization.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy T-4.2	Reduce emissions from County employee commutes.	
Action	Develop a rebate program for County employees to purchase electric vehicles, bicycles, and scooters for commute use.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through fuel switching or fossil fuel-free transportation modes.
Reducing waste	0	No impact.
Improving community health	1	Potential through active transportation incentivization.
Improving walking, biking, rolling, and transit options	2	Indirect through active transportation incentivization.
Improving air quality	2	Indirect through fuel switching or fossil fuel—free transportation modes.
Improving access to clean technology	1	Potential through clean technologies in alternative modes.
Saving the taxpayer money	0	No impact.
Promoting a green economy	1	Potential through clean technologies in alternative modes.
Saving money on utility bills	0	No impact.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	0	No impact.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	0	No impact.
Reducing GHG emissions quickly	2	Indirect through incentivization.
Prioritizing communities most at-risk to climate change	0	No impact.

Strategy T-5.1	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.
Action	Implement the County's Active Transportation Plan pedestrian and bicycle network improvements to encourage alternative modes of transportation in the unincorporated area.

Co-Benefit	Rating	Reasoning
Conserving land	1	Potential through integration with trail master plan
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential through increased network access.
Reducing waste	0	No impact.
Improving community health	3	Direct through active transportation mode use.
Improving walking, biking, rolling, and transit options	3	Direct through active transportation mode use.
Improving air quality	2	Indirect from active transportation mode use.
Improving access to clean technology	1	Potential through clean technologies associated with alternative transportation.
Saving the taxpayer money	0	No impact.
Promoting a green economy	1	Potential through increased use and maintenance of fossil fuel—free transportation modes.
Saving money on utility bills	0	No impact.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	1	Potential through integration with trail master plan.
Avoiding extra costs to the public	1	Potential dependent on connectivity of trails.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	3	Direct through support of improved bicycle and pedestrian infrastructure.
Reducing GHG emissions quickly	1	Potential through active transportation mode shift.
Prioritizing communities most at-risk to climate change	2	Indirect through prioritization of EJ communities in ATP.

Strategy T-5.2	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.
Action	Develop a countywide Safe Routes to Schools program.

Co-Benefit	Rating	Reasoning
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	0	No impact.
Reducing waste	0	No impact.
Improving community health	3	Direct through increased active transportation.
Improving walking, biking, rolling, and transit options	3	Direct through increased active transportation.
Improving air quality	2	Indirect through increased active transportation.
Improving access to clean technology	1	Potential through technologies associated with active transportation.
Saving the taxpayer money	0	No impact.
Promoting a green economy	0	No impact.
Saving money on utility bills	0	No impact.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	1	Potential through reduced cost of transportation.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Indirect through community support of improved pedestrian and bicycle infrastructure.
Reducing GHG emissions quickly	1	Potential through mode shift.
Prioritizing communities most at-risk to climate change	2	Indirect through access to transportation modes.

Strategy T-6.1	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	
Action	Develop a program to provide free transit passes and/or free trips in the unincorporated area and/or at County facilities.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	1	Potential through mode shift away from vehicles.
Reducing waste	0	No impact.
Improving community health	3	Direct through reduced vehicle trips.
Improving walking, biking, rolling, and transit options	3	Direct through increased access to transit.
Improving air quality	2	Indirect through reduced vehicle trips.
Improving access to clean technology	1	Potential through clean technology availability in transit services.
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Indirect through efficient transportation options.
Saving money on utility bills	0	No impact.
Expanding green workforce training	0	No impact.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	3	Direct through incentive.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Indirect through vehicle use reduction.
Reducing GHG emissions quickly	1	Potential through mode shift incentivization.
Prioritizing communities most at-risk to climate change	3	Direct through transportation mode access.

Strategy T-6.2	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area
Action	Increase access to Transit Priority Areas in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians.

Co-Benefit	Rating	Reasoning
Conserving land	1	Potential indirect incentive to develop in TPA
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through transportation efficiency and alternative modes.
Reducing waste	0	No impact.
Improving community health	2	Indirect through reduced vehicle use.
Improving walking, biking, rolling, and transit options	3	Direct through increased transit access.
Improving air quality	3	Direct through reduced vehicle use.
Improving access to clean technology	1	Potential associated with clean technologies in alternative transportation.
Saving the taxpayer money	3	Direct through developer cost to county
Promoting a green economy	2	Indirect through use of fewer fossil fuel—consuming transportation modes.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirect through fossil fuel—free mode use.
Reducing wildfire risk	1	Potential through infill development.
Avoiding extra costs to the public	1	Potential through increased access to services and reduced vehicle needs.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Indirect through support of vehicle miles traveled reductions.
Reducing GHG emissions quickly	1	Potential through land use.
Prioritizing communities most at-risk to climate change	3	Direct through access to technologies and transportation modes.

Strategy T-6.3	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	
Action	Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) within the unincorporated area.	
Co-Benefit	**Rating**	**Reasoning**
Conserving land	0	No impact.
Conserving water	0	No impact.
Using fewer fossil fuels	3	Direct through mode shift.
Reducing waste	0	No impact.
Improving community health	3	Direct through mode shift.
Improving walking, biking, rolling, and transit options	3	Direct through mode shift.
Improving air quality	3	Direct through reduced fossil fuel consumption.
Improving access to clean technology	2	Indirect through technologies associated with alternative transportation modes.
Saving the taxpayer money	0	No impact.
Promoting a green economy	2	Indirect through technologies and jobs associated with alternative transportation modes.
Saving money on utility bills	0	No impact.
Expanding green workforce training	2	Indirect through maintenance and jobs associated with alternative transportation modes.
Reducing wildfire risk	0	No impact.
Avoiding extra costs to the public	1	Potential through reduced transportation costs.
Increasing energy reliability	0	No impact.
Supporting community-driven projects	2	Indirect through community support of pedestrian and bicycle infrastructure and reduced VMT.
Reducing GHG emissions quickly	1	Potential through increased access.
Prioritizing communities most at-risk to climate change	2	Indirect from increased availability of and access to alternative transportation modes.

Attachment B
Co-Benefit Evaluation Tool Workbook Outputs

Step 1: Input CAP Measures and Actions

Action No.	Measure No.	Measure	Action	Sector
A-1.1	A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	Acquire 11,000 acres of conservation lands by 2030 to preserve land in perpetuity.	Agriculture and Conservation
A-1.2	A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	Develop a Habitat Restoration Resource Management Framework for County-owned land and restore 480 acres by 2030 to increase carbon storage.	Agriculture and Conservation
A-2.1	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	Expand the County's existing tree planting initiative and implement an Equity Driven Tree Planting Program to plant 87,539 trees by 2030 and 4,150 trees per year thereafter on County property and in the unincorporated area.	Agriculture and Conservation
A-2.2	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	Implement the County’s Landscaping Ordinance to require tree planting in new single family residential development to plant 12,402 trees by 2030.	Agriculture and Conservation
A-3.1	A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	Implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 4,873 acres of agricultural land by 2030 and 400 acres per year thereafter.	Agriculture and Conservation
A-4.1	A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	Develop a Carbon Farming Program to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.	Agriculture and Conservation
A-5.1	A-5	Reduce GHG emissions from agricultural operations.	Develop a program by 2026 to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.	Agriculture and Conservation
E-1.1	E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.	Energy
E-2.1	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric equipment in new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.	Energy
E-2.2	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	Increase energy efficiency and reach 30% electrification in residential and 17% electrification in non-residential existing development in the unincorporated area by 2030.	Energy
E-3.1	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Amend the County’s Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.	Energy
E-3.2	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.	Energy
E-3.3	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Incentivize residents in the unincorporated area to purchase 100% renewable energy from San Diego Community Power to increase renewable energy use in the unincorporated area.	Energy
SW-1.1	SW-1	Achieve Zero Waste in County Operations.	Adopt a County Operations zero waste policy by 2030 to achieve zero waste (90% diversion).	Solid Waste
SW-2.1	SW-2	Achieve zero waste within the unincorporated area.	Update the County's Strategic Plan to Reduce Waste to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.	Solid Waste
SW-3.1	SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	Expand landfill gas systems at County-owned landfills to exceed State requirements by 5% by 2030 and 10% by 2045.	Solid Waste
SW-4.1	SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	Conduct a feasibility study and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% in the unincorporated area by 2045.	Solid Waste

T-1.1	T-1	Reduce fleet and small equipment emissions in County Operations.	Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045	Built Environment and Transportation
T-1.2	T-1	Reduce fleet and small equipment emissions in County Operations.	Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.	Built Environment and Transportation
T-2.1	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	Develop a program by 2026 to provide residents and businesses incentives to purchase alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 3% by 2030.	Built Environment and Transportation
T-2.2	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.	Built Environment and Transportation
T-3.1	T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	Increase the use of electric and other zero emission vehicles in the unincorporated area.	Built Environment and Transportation
T-4.1	T-4	Reduce emissions from County employee commutes.	Expand County Benefit Program by 2026 to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time teleworking options to reduce vehicle miles traveled from employee commutes by 40% in 2030 and 60% in 2045.	Built Environment and Transportation
T-4.2	T-4	Reduce emissions from County employee commutes.	Develop a rebate program by 2026 for County employees to purchase electric vehicles, bicycles, and scooters for commute use.	Built Environment and Transportation
T-5.1	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the unincorporated area.	Built Environment and Transportation
T-5.2	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	Develop a countywide Safe Routes to Schools program to reduce vehicle miles traveled to schools by 1.2% by 2030.	Built Environment and Transportation
T-6.1	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Develop a program to provide free transit passes and/or free trips in the unincorporated area to reduce vehicle miles traveled in the unincorporated area by 1.2% by 2030.	Built Environment and Transportation
T-6.2	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Increase access to Transit Priority Areas by 5% in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians by 2030.	Built Environment and Transportation
T-6.3	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) to reduce vehicle miles traveled by 7% within the unincorporated area by 2030.	Built Environment and Transportation
W-1.1	W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	Update the County’s Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.	Water and Wastewater
W-2.1	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 20% in the unincorporated area.	Water and Wastewater
W-2.2	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen water efficiency requirements for existing development projects with qualifying improvements.	Water and Wastewater
W-2.3	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Update the Green Building Incentive program by 2026 to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.	Water and Wastewater
W-2.4	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.	Water and Wastewater
W-3.1	W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	Increase wastewater treatment efficiency through the East County Advanced Water Purification Program to produce 12,900 acre feet of water each year by 2030.	Water and Wastewater

Step 2a: Input Co-Benefits

Co-Benefit	Strategic Initiative
Conserving land	Sustainability
Conserving water	Sustainability
Using fewer fossil fuels	Sustainability
Reducing waste	Sustainability
Improving community health	Equity
Improving walking, biking, rolling, and transit options	Equity
Improving air quality	Equity
Improving access to clean technology	Equity
Saving the taxpayer money	Empower
Promoting a green economy	Empower
Saving money on utility bills	Empower
Expanding green workforce training	Empower
Reducing wildfire risk	Community
Avoiding extra costs to the public	Community
Increasing energy reliability	Community
Supporting community-driven projects	Justice
Reducing GHG emissions quickly	Justice
Prioritizing communities most at-risk to climate change	Justice

Step 2b: Co-Benefit Ratings

Enter a value between 0 and 3. 0 = no impact to co-benefit 1 = Low impact to co-benefit; 2 = medium impact to co-benefit; 3 = major impact to co-benefit

		Strategic Initiative:	Sustainability				Equity				Empower				Community			Justice		
		Co-Benefit:	Conserving land	Conserving water	Using fewer fossil fuels	Reducing waste	Improving community health	Improving walking, biking, rolling, and transit options	Improving air quality	Improving access to clean technology	Saving the taxpayer money	Promoting a green economy	Saving money on utility bills	Expanding green workforce training	Reducing wildfire risk	Avoiding extra costs to the public	Increasing energy reliability	Supporting community-driven projects	Reducing GHG emissions quickly	Prioritizing communities most at-risk to climate change
Action	Measure	Action																		
A-1.2	A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	2	1	1	1	3	1	3	0	0	0	0	2	3	0	0	2	2	0
A-2.1	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	1	1	1	0	3	2	3	0	0	1	2	1	2	3	0	3	2	3
A-2.2	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	1	0	1	0	3	1	3	0	0	1	3	1	2	0	0	0	2	1
A-3.1	A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	3	1	0	1	2	0	1	1	0	2	0	1	1	0	0	1	2	0
A-4.1	A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly	2	2	2	2	2	0	2	2	0	3	1	2	1	3	0	2	2	2
A-5.1	A-5	Reduce GHG emissions from agricultural operations.	0	0	3	0	1	0	3	3	0	3	0	2	0	2	0	1	2	2
E-1.1	E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	0	0	3	0	1	0	1	1	1	2	0	1	0	0	1	0	3	0
E-2.1	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-2.2	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-3.1	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0	0	2	0	3	0	1	3	0	3	3	2	0	0	0	1	2	0
E-3.2	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0	0	1	0	1	0	3	3	0	3	3	2	0	3	1	1	2	1
E-3.3	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0	0	1	0	1	0	3	3	0	3	2	0	0	2	1	2	3	1
SW-1.1	SW-1	Achieve Zero Waste in County Operations.	0	0	1	3	0	0	2	1	0	2	0	2	0	0	1	0	3	0
SW-2.1	SW-2	Achieve zero waste within the unincorporated area.	0	0	1	3	1	0	2	1	0	2	0	2	0	0	1	2	1	0
SW-3.1	SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	0	0	1	0	2	0	3	1	0	2	0	1	0	0	1	0	3	0
SW-4.1	SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	0	0	1	0	2	0	3	2	0	2	0	1	0	0	1	0	1	0

T-1.1	T-1	Reduce fleet and small equipment emissions in County Operations.	0	0	3	0	2	0	3	2	1	2	0	1	0	0	0	0	3	0
T-1.2	T-1	Reduce fleet and small equipment emissions in County Operations.	0	0	3	0	2	0	3	2	1	2	0	1	0	0	0	0	3	0
T-2.1	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	0	0	3	0	2	0	3	3	0	3	0	2	0	3	0	1	2	2
T-2.2	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	0	0	3	0	2	0	3	3	0	3	0	2	0	0	0	1	3	0
T-3.1	T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	0	0	3	0	2	0	3	3	1	3	0	3	0	2	1	3	3	3
T-4.1	T-4	Reduce emissions from County employee commutes.	0	0	3	0	1	2	2	1	0	1	0	0	0	0	0	0	2	0
T-4.2	T-4	Reduce emissions from County employee commutes.	0	0	3	0	1	2	2	1	0	1	0	0	0	0	0	0	2	0
T-5.1	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	1	0	1	0	3	3	2	1	0	1	0	0	1	1	0	3	1	2
T-5.2	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	0	0	0	0	3	3	2	1	0	0	0	0	0	1	0	2	1	2
T-6.1	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	0	0	1	0	3	3	2	1	0	2	0	0	0	3	0	2	1	3
T-6.2	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	1	0	3	0	2	3	3	1	3	2	0	2	1	1	0	2	1	3
T-6.3	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	0	0	3	0	3	3	3	2	0	2	0	2	0	1	0	2	1	2
W-1.1	W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	0	3	2	0	1	0	1	1	1	2	0	1	1	0	0	1	2	0
W-2.1	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0	3	2	0	1	0	1	2	0	3	3	2	1	0	0	0	2	0
W-2.2	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0	3	2	0	1	0	1	2	0	3	3	2	1	0	0	0	2	0
W-2.3	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0	3	2	0	1	0	1	1	0	2	3	1	0	3	0	1	1	1
W-2.4	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0	3	2	0	1	0	1	1	0	2	3	1	1	3	0	2	1	1
W-3.1	W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	0	3	1	0	1	0	0	2	0	3	0	2	0	1	0	1	3	3

Step 3: Stakeholder Weighting

	Co-Benefit	Total Checks	Weight
Sustainability	Conserving land	460	1.90
	Conserving water	494	2.00
	Using fewer fossil fuels	243	1.23
	Reducing waste	298	1.40
Equity	Improving community health	430	1.80
	Improving walking, biking, rolling, and transit options	382	1.66
	Improving air quality	411	1.75
	Improving access to clean technology	295	1.39
Empower	Saving the taxpayer money	318	1.46
	Promoting a green economy	333	1.51
	Saving money on utility bills	458	1.89
	Expanding green workforce training	168	1.00
Community	Reducing wildfire risk	409	1.74
	Avoiding extra costs to the public	293	1.38
	Increasing energy reliability	334	1.51
Justice	Supporting community-driven projects	210	1.13
	Reducing GHG emissions quickly	180	1.04
	Prioritizing communities most at-risk to climate change	294	1.39

Top 3 Co-Benefits
Conserving water
Conserving land
Saving money on utility bills

Step 4a: Weighted Scores

MIN: 0 MAX: 6 ST DV: 6

		Strategic Initiative:	Sustainability				Equity				Empower				Community			Justice		
		Weighting:	190%	200%	123%	140%	180%	166%	175%	139%	146%	151%	189%	100%	174%	138%	151%	113%	104%	139%
Action	Measure	Details	Conserving land	Conserving water	Using fewer fossil fuels	Reducing waste	Improving community health	Improving walking, biking, rolling, and transit options	Improving air quality	Improving access to clean technology	Saving the taxpayer money	Promoting a green economy	Saving money on utility bills	Expanding green workforce training	Reducing wildfire risk	Avoiding extra costs to the public	Increasing energy reliability	Supporting community-driven projects	Reducing GHG emissions quickly	Prioritizing communities most at-risk to climate change
A-1.2	A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	3.79	2.00	1.23	1.40	5.41	1.66	5.24	0.00	0.00	0.00	0.00	2.00	5.22	0.00	0.00	2.26	2.07	0.00
A-2.1	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	1.90	2.00	1.23	0.00	5.41	3.31	5.24	0.00	0.00	1.51	3.78	1.00	3.48	4.15	0.00	3.39	2.07	4.16
A-2.2	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	1.90	0.00	1.23	0.00	5.41	1.66	5.24	0.00	0.00	1.51	5.67	1.00	3.48	0.00	0.00	0.00	2.07	1.39
A-3.1	A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	5.69	2.00	0.00	1.40	3.61	0.00	1.75	1.39	0.00	3.01	0.00	1.00	1.74	0.00	0.00	1.13	2.07	0.00
A-4.1	A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly	3.79	4.00	2.46	2.80	3.61	0.00	3.49	2.78	0.00	4.52	1.89	2.00	1.74	4.15	0.00	2.26	2.07	2.77
A-5.1	A-5	Reduce GHG emissions from agricultural operations.	0.00	0.00	3.69	0.00	1.80	0.00	5.24	4.17	0.00	4.52	0.00	2.00	0.00	2.77	0.00	1.13	2.07	2.77
E-1.1	E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	0.00	0.00	3.69	0.00	1.80	0.00	1.75	1.39	1.46	3.01	0.00	1.00	0.00	0.00	1.51	0.00	3.11	0.00
E-2.1	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0.00	0.00	2.46	0.00	5.41	0.00	1.75	4.17	0.00	4.52	5.67	2.00	0.00	0.00	0.00	1.13	2.07	0.00
E-2.2	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0.00	0.00	2.46	0.00	5.41	0.00	1.75	4.17	0.00	4.52	5.67	2.00	0.00	0.00	0.00	1.13	2.07	0.00
E-3.1	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0.00	0.00	2.46	0.00	5.41	0.00	1.75	4.17	0.00	4.52	5.67	2.00	0.00	0.00	0.00	1.13	2.07	0.00
E-3.2	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0.00	0.00	1.23	0.00	1.80	0.00	5.24	4.17	0.00	4.52	5.67	2.00	0.00	4.15	1.51	1.13	2.07	1.39
E-3.3	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	0.00	0.00	1.23	0.00	1.80	0.00	5.24	4.17	0.00	4.52	3.78	0.00	0.00	2.77	1.51	2.26	3.11	1.39
SW-1.1	SW-1	Achieve Zero Waste in County Operations.	0.00	0.00	1.23	4.20	0.00	0.00	3.49	1.39	0.00	3.01	0.00	2.00	0.00	0.00	1.51	0.00	3.11	0.00
SW-2.1	SW-2	Achieve zero waste within the unincorporated area.	0.00	0.00	1.23	4.20	1.80	0.00	3.49	1.39	0.00	3.01	0.00	2.00	0.00	0.00	1.51	2.26	1.04	0.00
SW-3.1	SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	0.00	0.00	1.23	0.00	3.61	0.00	5.24	1.39	0.00	3.01	0.00	1.00	0.00	0.00	1.51	0.00	3.11	0.00
SW-4.1	SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	0.00	0.00	1.23	0.00	3.61	0.00	5.24	2.78	0.00	3.01	0.00	1.00	0.00	0.00	1.51	0.00	1.04	0.00

T-1.1	T-1	Reduce fleet and small equipment emissions in County Operations.	0.00	0.00	3.69	0.00	3.61	0.00	5.24	2.78	1.46	3.01	0.00	1.00	0.00	0.00	0.00	0.00	3.11	0.00
T-1.2	T-1	Reduce fleet and small equipment emissions in County Operations.	0.00	0.00	3.69	0.00	3.61	0.00	5.24	2.78	1.46	3.01	0.00	1.00	0.00	0.00	0.00	0.00	3.11	0.00
T-2.1	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	0.00	0.00	3.69	0.00	3.61	0.00	5.24	4.17	0.00	4.52	0.00	2.00	0.00	4.15	0.00	1.13	2.07	2.77
T-2.2	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	0.00	0.00	3.69	0.00	3.61	0.00	5.24	4.17	0.00	4.52	0.00	2.00	0.00	0.00	0.00	1.13	3.11	0.00
T-3.1	T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	0.00	0.00	3.69	0.00	3.61	0.00	5.24	4.17	1.46	4.52	0.00	3.00	0.00	2.77	1.51	3.39	3.11	4.16
T-4.1	T-4	Reduce emissions from County employee commutes.	0.00	0.00	3.69	0.00	1.80	3.31	3.49	1.39	0.00	1.51	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.00
T-4.2	T-4	Reduce emissions from County employee commutes.	0.00	0.00	3.69	0.00	1.80	3.31	3.49	1.39	0.00	1.51	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.00
T-5.1	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	1.90	0.00	1.23	0.00	5.41	4.97	3.49	1.39	0.00	1.51	0.00	0.00	1.74	1.38	0.00	3.39	1.04	2.77
T-5.2	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	0.00	0.00	0.00	0.00	5.41	4.97	3.49	1.39	0.00	0.00	0.00	0.00	0.00	1.38	0.00	2.26	1.04	2.77
T-6.1	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	0.00	0.00	1.23	0.00	5.41	4.97	3.49	1.39	0.00	3.01	0.00	0.00	0.00	4.15	0.00	2.26	1.04	4.16
T-6.2	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	1.90	0.00	3.69	0.00	3.61	4.97	5.24	1.39	4.38	3.01	0.00	2.00	1.74	1.38	0.00	2.26	1.04	4.16
T-6.3	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	0.00	0.00	3.69	0.00	5.41	4.97	5.24	2.78	0.00	3.01	0.00	2.00	0.00	1.38	0.00	2.26	1.04	2.77
W-1.1	W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	0.00	6.00	2.46	0.00	1.80	0.00	1.75	1.39	1.46	3.01	0.00	1.00	1.74	0.00	0.00	1.13	2.07	0.00
W-2.1	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0.00	6.00	2.46	0.00	1.80	0.00	1.75	2.78	0.00	4.52	5.67	2.00	1.74	0.00	0.00	0.00	2.07	0.00
W-2.2	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0.00	6.00	2.46	0.00	1.80	0.00	1.75	2.78	0.00	4.52	5.67	2.00	1.74	0.00	0.00	0.00	2.07	0.00
W-2.3	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0.00	6.00	2.46	0.00	1.80	0.00	1.75	1.39	0.00	3.01	5.67	1.00	0.00	4.15	0.00	1.13	1.04	1.39
W-2.4	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	0.00	6.00	2.46	0.00	1.80	0.00	1.75	1.39	0.00	3.01	5.67	1.00	1.74	4.15	0.00	2.26	1.04	1.39
W-3.1	W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	0.00	6.00	1.23	0.00	1.80	0.00	0.00	2.78	0.00	4.52	0.00	2.00	0.00	1.38	0.00	1.13	3.11	4.16

Step 4b: Normalize Weighted Scores

Set Weighting Range: Max: 3 Min: 0

			Strategic Initiative:	Sustainability				Equity				Empower				Community			Justice		
	Measure		Details / Co-Benefit:	Conserving land	Conserving water	Using fewer fossil fuels	Reducing waste	Improving community health	Improving walking, biking, rolling, and transit options	Improving air quality	Improving access to clean technology	Saving the taxpayer money	Promoting a green economy	Saving money on utility bills	Expanding green workforce training	Reducing wildfire risk	Avoiding extra costs to the public	Increasing energy reliability	Supporting community-driven projects	Reducing GHG emissions quickly	Prioritizing communities most at-risk to climate change
A-1.2	A-1	Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	Develop a Habitat Restoration Resource Management Framework for County-owned land and restore 480 acres by 2030 to increase carbon storage.	1.90	1.00	0.62	0.70	2.71	0.83	2.62	0.00	0.00	0.00	0.00	1.00	2.61	0.00	0.00	1.13	1.04	0.00
A-2.1	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	Expand the County's existing tree planting initiative and implement an Equity Driven Tree Planting Program to plant 87,539 trees by 2030 and 4,150 trees per year thereafter on County	0.95	1.00	0.62	0.00	2.71	1.66	2.62	0.00	0.00	0.75	1.89	0.50	1.74	2.08	0.00	1.69	1.04	2.08
A-2.2	A-2	Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities.	Implement the County's Landscaping Ordinance to require tree planting in new single family residential development to plant 12,402 trees by 2030.	0.95	0.00	0.62	0.00	2.71	0.83	2.62	0.00	0.00	0.75	2.83	0.50	1.74	0.00	0.00	0.00	1.04	0.69
A-3.1	A-3	Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	Implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 4,873 acres of agricultural land by 2030 and 400 acres per year thereafter.	2.84	1.00	0.00	0.70	1.80	0.00	0.87	0.69	0.00	1.51	0.00	0.50	0.87	0.00	0.00	0.56	1.04	0.00
A-4.1	A-4	Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and support climate-friendly farming practices.	Develop a Carbon Farming Program to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.	1.90	2.00	1.23	1.40	1.80	0.00	1.75	1.39	0.00	2.26	0.94	1.00	0.87	2.08	0.00	1.13	1.04	1.39
A-5.1	A-5	Reduce GHG emissions from agricultural operations.	Develop a program by 2026 to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.	0.00	0.00	1.85	0.00	0.90	0.00	2.62	2.08	0.00	2.26	0.00	1.00	0.00	1.38	0.00	0.56	1.04	1.39
E-1.1	E-1	Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.	0.00	0.00	1.85	0.00	0.90	0.00	0.87	0.69	0.73	1.51	0.00	0.50	0.00	0.00	0.75	0.00	1.56	0.00
E-2.1	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric equipment in new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.	0.00	0.00	1.23	0.00	2.71	0.00	0.87	2.08	0.00	2.26	2.83	1.00	0.00	0.00	0.00	0.56	1.04	0.00
E-2.2	E-2	Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	Increase energy efficiency and reach 30% electrification in residential and 17% electrification in non-residential existing development in the unincorporated area by 2030.	0.00	0.00	1.23	0.00	2.71	0.00	0.87	2.08	0.00	2.26	2.83	1.00	0.00	0.00	0.00	0.56	1.04	0.00
E-3.1	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.	0.00	0.00	1.23	0.00	2.71	0.00	0.87	2.08	0.00	2.26	2.83	1.00	0.00	0.00	0.00	0.56	1.04	0.00
E-3.2	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.	0.00	0.00	0.62	0.00	0.90	0.00	2.62	2.08	0.00	2.26	2.83	1.00	0.00	2.08	0.75	0.56	1.04	0.69
E-3.3	E-3	Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area.	Incentivize residents in the unincorporated area to purchase 100% renewable energy from San Diego Community Power to increase renewable energy use in the unincorporated area.	0.00	0.00	0.62	0.00	0.90	0.00	2.62	2.08	0.00	2.26	1.89	0.00	0.00	1.38	0.75	1.13	1.56	0.69
SW-1.1	SW-1	Achieve Zero Waste in County Operations.	Adopt a County Operations zero waste policy by 2030 to achieve zero waste (90% diversion).	0.00	0.00	0.62	2.10	0.00	0.00	1.75	0.69	0.00	1.51	0.00	1.00	0.00	0.00	0.75	0.00	1.56	0.00
SW-2.1	SW-2	Achieve zero waste within the unincorporated area.	Update the County's Strategic Plan to Reduce Waste to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.	0.00	0.00	0.62	2.10	0.90	0.00	1.75	0.69	0.00	1.51	0.00	1.00	0.00	0.00	0.75	1.13	0.52	0.00

SW-3.1	SW-3	Improve waste management practices at County-owned solid waste facilities to reduce emissions.	Expand landfill gas systems at County-owned landfills to exceed State requirements by 5% by 2030 and 10% by 2045.	0.00	0.00	0.62	0.00	1.80	0.00	2.62	0.69	0.00	1.51	0.00	0.50	0.00	0.00	0.75	0.00	1.56	0.00
SW-4.1	SW-4	Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion.	Conduct a feasibility study and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% in the unincorporated area by 2045.	0.00	0.00	0.62	0.00	1.80	0.00	2.62	1.39	0.00	1.51	0.00	0.50	0.00	0.00	0.75	0.00	0.52	0.00

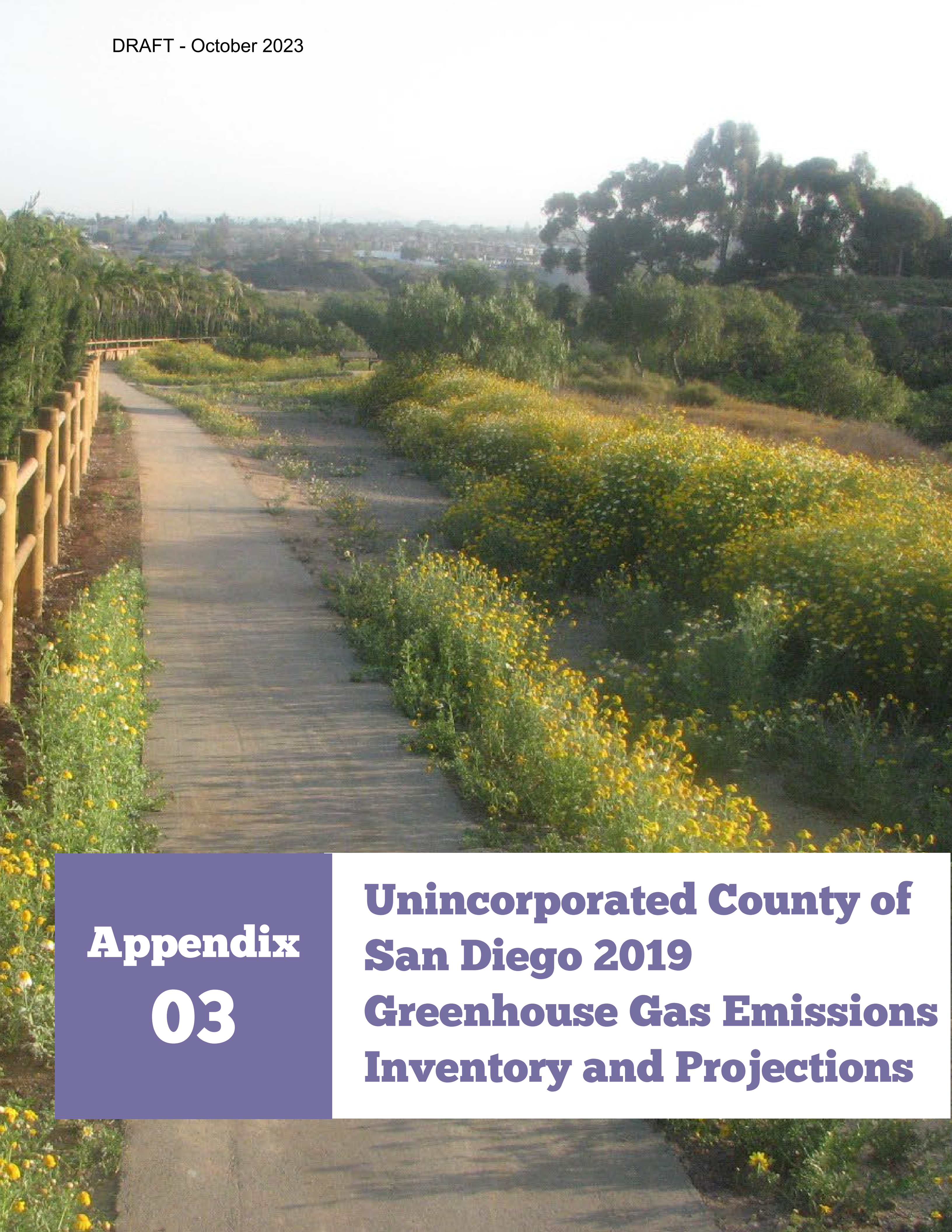
T-1.1	T-1	Reduce fleet and small equipment emissions in County Operations.	Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045	0.00	0.00	1.85	0.00	1.80	0.00	2.62	1.39	0.73	1.51	0.00	0.50	0.00	0.00	0.00	0.00	1.56	0.00
T-1.2	T-1	Reduce fleet and small equipment emissions in County Operations.	Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.	0.00	0.00	1.85	0.00	1.80	0.00	2.62	1.39	0.73	1.51	0.00	0.50	0.00	0.00	0.00	0.00	1.56	0.00
T-2.1	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	Develop a program by 2026 to provide residents and businesses incentives to purchase alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 3% by 2030.	0.00	0.00	1.85	0.00	1.80	0.00	2.62	2.08	0.00	2.26	0.00	1.00	0.00	2.08	0.00	0.56	1.04	1.39
T-2.2	T-2	Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area.	Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.	0.00	0.00	1.85	0.00	1.80	0.00	2.62	2.08	0.00	2.26	0.00	1.00	0.00	0.00	0.00	0.56	1.56	0.00
T-3.1	T-3	Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area.	Increase the use of electric and other zero emission vehicles in the unincorporated area.	0.00	0.00	1.85	0.00	1.80	0.00	2.62	2.08	0.73	2.26	0.00	1.50	0.00	1.38	0.75	1.69	1.56	2.08
T-4.1	T-4	Reduce emissions from County employee commutes.	Expand County Benefit Program by 2026 to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time	0.00	0.00	1.85	0.00	0.90	1.66	1.75	0.69	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00
T-4.2	T-4	Reduce emissions from County employee commutes.	Develop a rebate program by 2026 for County employees to purchase electric vehicles, bicycles, and scooters for commute use.	0.00	0.00	1.85	0.00	0.90	1.66	1.75	0.69	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00
T-5.1	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the	0.95	0.00	0.62	0.00	2.71	2.48	1.75	0.69	0.00	0.75	0.00	0.00	0.87	0.69	0.00	1.69	0.52	1.39
T-5.2	T-5	Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency.	Develop a countywide Safe Routes to Schools program to reduce vehicle miles traveled to schools by 1.2% by 2030.	0.00	0.00	0.00	0.00	2.71	2.48	1.75	0.69	0.00	0.00	0.00	0.00	0.00	0.69	0.00	1.13	0.52	1.39
T-6.1	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Develop a program to provide free transit passes and/or free trips in the unincorporated area to reduce vehicle miles traveled in the unincorporated area by 1.2% by 2030.	0.00	0.00	0.62	0.00	2.71	2.48	1.75	0.69	0.00	1.51	0.00	0.00	0.00	2.08	0.00	1.13	0.52	2.08
T-6.2	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Increase access to Transit Priority Areas by 5% in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians by 2030.	0.95	0.00	1.85	0.00	1.80	2.48	2.62	0.69	2.19	1.51	0.00	1.00	0.87	0.69	0.00	1.13	0.52	2.08
T-6.3	T-6	Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) to reduce vehicle miles traveled by 7% within the unincorporated area by 2030.	0.00	0.00	1.85	0.00	2.71	2.48	2.62	1.39	0.00	1.51	0.00	1.00	0.00	0.69	0.00	1.13	0.52	1.39
W-1.1	W-1	Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	Update the County’s Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.	0.00	3.00	1.23	0.00	0.90	0.00	0.87	0.69	0.73	1.51	0.00	0.50	0.87	0.00	0.00	0.56	1.04	0.00
W-2.1	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 20% in the unincorporated area.	0.00	3.00	1.23	0.00	0.90	0.00	0.87	1.39	0.00	2.26	2.83	1.00	0.87	0.00	0.00	0.00	1.04	0.00
W-2.2	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen water efficiency requirements for existing development projects with qualifying improvements.	0.00	3.00	1.23	0.00	0.90	0.00	0.87	1.39	0.00	2.26	2.83	1.00	0.87	0.00	0.00	0.00	1.04	0.00

W-2.3	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Update the Green Building Incentive program by 2026 to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.	0.00	3.00	1.23	0.00	0.90	0.00	0.87	0.69	0.00	1.51	2.83	0.50	0.00	2.08	0.00	0.56	0.52	0.69
W-2.4	W-2	Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area.	Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.	0.00	3.00	1.23	0.00	0.90	0.00	0.87	0.69	0.00	1.51	2.83	0.50	0.87	2.08	0.00	1.13	0.52	0.69
W-3.1	W-3	Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use.	Increase wastewater treatment efficiency through the East County Advanced Water Purification Program to produce 12,900 acre feet of water each year by 2030.	0.00	3.00	0.62	0.00	0.90	0.00	0.00	1.39	0.00	2.26	0.00	1.00	0.00	0.69	0.00	0.56	1.56	2.08

Step 5: Strategic Initiative and Community Priority Scores

Measures	Sustainability Score	Equity Score	Empower Score	Community Score	Justice Score	Community Priority Scor
	Strategic Initiative Scores					
A-4						
Incentivize carbon farming to expand carbon storage capacity in conventionally farmed agricultural land and supp	1.63	1.23	1.05	0.98	1.18	6.08
T-3						
Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated a	0.46	1.63	1.12	0.71	1.78	5.70
A-2						
Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underservec	0.52	1.64	0.90	0.93	1.09	5.08
T-6						
Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorp	0.44	2.04	0.73	0.48	1.17	4.85
A-1						
Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential.	1.05	1.54	0.25	0.87	0.72	4.43
E-3						
Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated a	0.21	1.41	1.36	0.55	0.81	4.33
W-2						
Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, ret	1.06	0.70	1.37	0.56	0.52	4.21
A-5						
Reduce GHG emissions from agricultural operations.	0.46	1.40	0.81	0.46	1.00	4.13
T-2						
Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the uninco	0.46	1.63	0.81	0.35	0.85	4.10
W-3						
Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable wate	0.90	0.57	0.81	0.23	1.40	3.92
E-2						
Develop policies and programs to increase energy efficiency and electrification in the unincorporated area.	0.31	1.42	1.52	0.00	0.53	3.78
T-5						
Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase tran	0.20	1.91	0.09	0.38	1.11	3.68
A-3						
Preserve agricultural lands to prioritize carbon storage and balance economic and development goals.	1.14	0.84	0.50	0.29	0.53	3.30
W-1						
Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations.	1.06	0.62	0.68	0.29	0.53	3.18
T-1						
Reduce fleet and small equipment emissions in County Operations.	0.46	1.45	0.68	0.00	0.52	3.12
SW-2						
Achieve zero waste within the unincorporated area.	0.68	0.84	0.63	0.25	0.55	2.94
SW-3						
Improve waste management practices at County-owned solid waste facilities to reduce emissions.	0.15	1.28	0.50	0.25	0.52	2.70
SW-1						
Achieve Zero Waste in County Operations.	0.68	0.61	0.63	0.25	0.52	2.68
E-1						
Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations.	0.46	0.62	0.68	0.25	0.52	2.53
SW-4						
Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversi	0.15	1.45	0.50	0.25	0.17	2.53
T-4						
Reduce emissions from County employee commutes.	0.46	1.25	0.19	0.00	0.35	2.24

DRAFT - October 2023



Appendix 03

Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections

Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections

October 2023

Prepared for the County of San Diego

Prepared by the Energy Policy Initiatives Center
University of San Diego and Ascent

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

ASCENT

About EPIC

The Energy Policy Initiatives Center (EPIC) is a non-profit research center of the University of San Diego 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.

For more information, please visit EPIC's website at www.sandiego.edu/epic.

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October 2023

Appendices

A. County of San Diego Climate Action Plan Inventory Transportation Modeling Overview

B. Climate Action Plan Update - Population, Housing, and Employment Market Capacity Study for the Unincorporated Area

Energy Policy Initiatives Center (EPIC)
University of San Diego

1. Overview

This document presents a summary of the calendar year 2019 greenhouse gas (GHG) emissions from the unincorporated County of San Diego (the unincorporated county, or the county), and the 2025, 2030, 2035, 2040, 2045, and 2050 emissions projections. The 2019 GHG emissions inventory was developed using the Local Governments for Sustainability (ICLEI) U.S. Community Protocol for Reporting of Greenhouse Gas Emissions (U.S. Community Protocol), which includes methodologies for local governments to measure and report emissions. The emissions projections show changes in emissions over time from anticipated population, housing, and employment growth, as well as the future impact of Federal and California regulations, policies, and programs adopted as of 2022 that would reduce GHG emissions from future activities.

The inventory and projections include emissions from community activities and sources under the jurisdiction of the County of San Diego, and from County government operations. The emissions from County government operations are based on analysis performed for the County by Ascent. Some County operations occur outside of the boundaries of the unincorporated county (e.g., County buildings located in incorporated cities) and are included in the inventory and projections. Conversely, some community activities and sources take place within the boundaries of the unincorporated county but are not under the jurisdiction of the County (e.g., Tribal lands and Marine Corps Base Camp Pendleton) and are therefore excluded. This document includes the following sections:

- Section 2 describes the background sources and common assumptions used for the inventory and projections;
- Section 3 shows a summary of the 2019 GHG emissions inventory;
- Section 4 discusses the methods used to prepare each category of the 2019 inventory;
- Section 5 shows a summary of the 2025, 2030, 2035, 2040, 2045, and 2050 emissions projections; and
- Section 6 discusses the methods used to project each category of GHG emissions through 2050.

Rounding is used only for the final GHG value within the tables and figures throughout the document, for community-wide emissions and emissions from County government operations. 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. Because of rounding, some totals may not equal the exact values summed in any table or figure.

2. Background

2.1 Greenhouse Gases

The GHGs included in the emissions inventory and projections are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Each GHG has a different capacity to trap heat in the atmosphere, known as its global warming potential (GWP), which is normalized relative to CO_2 and expressed in carbon dioxide equivalents (CO_2e). The 100-year GWPs reported by the Intergovernmental Panel on Climate Change (IPCC) in the Fourth Assessment Report (AR4) were used to estimate GHG emissions, consistent with the approach used by the California Air Resources Board (CARB) in the 2000–2020 statewide GHG inventory.[1] The GWPs used in this inventory are provided in Table 1.

[1] IPCC: Fourth Assessment Report Climate Change 2007: Direct Global Warming Potentials (2013). CARB: GHG Global Warming Potentials.

Table 1 Global Warming Potentials

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298
Source: IPCC 2013	

2.2 Categories of Community Emissions

The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol) requires a minimum of five basic emissions-generating activities to be included in a Protocol-compliant community-scale GHG inventory.[2] These activity categories are: electricity, stationary fuel combustion (natural gas and propane), on-road transportation, water and wastewater, and solid waste. GHG emissions were calculated by multiplying activity data (e.g., tons of solid waste) by an emission factor (e.g., pounds of CO_2e per unit of waste disposed). For these five categories, methods used in this inventory were based on the U.S. Community Protocol standard methods and modified with regional- or county-specific data when available, as discussed in Section 4 and Section 6. The community emissions categories included in this document are shown in Table 2.

In addition, GHG emissions from off-road transportation and agriculture were included in the inventory and projections, based on the methods and models used by CARB in the statewide GHG emission inventory or in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.[3] Specified emission factors in the wastewater sector are from the CARB statewide GHG emissions inventory and 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Table 2 Community Emissions Categories Included in This Document Compared with U.S. Community Protocol Requirements

Emissions Category	This Inventory and Projection	U.S. Community Protocol
On-Road Transportation	Included	Required
Electricity	Included	Required
Stationary Fuel Combustion	Included	Required
Natural Gas	Included	Required
Propane	Included	Required
Waste	Included	Required
Waste Facilities located in the Community	Included	Optional
Community Generated Waste	Included	Required
Off-Road Transportation	Included	Optional
Agriculture	Included	Optional
Water and Wastewater	Included	Optional

[2] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019).
[3] CARB: 2020-2020 GHG Inventory (2022 Edition). IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

2.2.1 Inclusion of County Operations

The inventory and projections also include emissions associated with County operations. County operations are added to the Unincorporated County inventory and projections because County operations exist to serve the interests of the community in the unincorporated county and the County has jurisdiction over both the unincorporated county and the government operations that serve it. The inclusion of both emissions in the unincorporated areas and from County operations provides a full picture of the GHG emissions for which the County can directly implement measures to reduce. Additional details on the contribution of County operational emissions to the Unincorporated County inventory are available in the *County of San Diego Local Government Operations Greenhouse Gas 2019 Inventory and Projections* (County of San Diego 2023).

The County's operations GHG inventory was compiled for the following emissions sectors, pursuant to the Local Government Operations Protocol (LGOP), Version 1.1.

- Airports
- Buildings & Other Facilities
- Employee Commute
- Landfills
- Public Lighting
- Solid Waste
- Vehicle Fleet
- Wastewater Facilities
- Water Pumping
- Water Use

GHG emissions from County operations can overlap with emissions-generating activities and sources included in the community-wide inventory and projections. County operations activities that occur within the unincorporated county are assumed to be accounted for in the community-wide inventory and projections for the unincorporated county because the methodology is based on location of the activity or source within physical boundaries. In addition, County employee vehicles trips start and/or end within the unincorporated county are also included in the community-wide inventory.

In general, County operations emissions occurring outside the unincorporated county include energy use and solid waste generation at County-owned and operated buildings, usually located in incorporated cities; employee commutes to those buildings; and emissions from some County-operated landfills. Table 3 provides further details on the portions of County operations that are assumed to be reflected in the community-wide emissions inventory and projections.

County operations activities located outside the unincorporated county, such as County buildings and facilities located within incorporated cities, are not accounted for in the community-wide inventory and projections, therefore, such operational emissions have been added to community-wide emissions in this report to present a more complete picture of total emissions within the jurisdiction of the County.

Table 3 County of San Diego Operations Emissions included in Community-Wide Emissions

County Operations Sector	Portion of County Operations Emissions included in Community-Wide Emissions	Reason
Airports	Part	All County airports except McClellan-Palomar and Gillespie Field are located in the unincorporated county.
Buildings & Other Facilities	Part	Only County government buildings and facilities located within the unincorporated county are included.
Employee Commute	Part	Only County employee commute trips that end and/or begin in the unincorporated county are included.
Landfills	Part	Four out of the 11 closed landfills operated by the County are located in the unincorporated county.
Public Lighting (Streetlights and Traffic Signals)	All	All County streetlights and traffic signals are located in the unincorporated county.
Solid Waste	None	A vast majority of County government buildings and facilities generating solid waste are located outside the unincorporated county (e.g., main offices)
Vehicle Fleet	All	Assumes vast majority of County government vehicle fleet operations occur in part or fully within the unincorporated county.
Wastewater Facilities	All	All County wastewater facilities are located in the unincorporated county.
Water Pumping	All	All County water pumping facilities are located in the unincorporated county.
Water Use	Part	Some County facilities using water are located in the unincorporated county.

Source: Ascent Environmental in 2023.

2.3 Jurisdiction Boundaries

In addition to private property and land owned by the County government, the unincorporated county also includes lands which are outside the County's land use jurisdiction and direct control, including tribal, military, State, and other Federally owned lands.[4] Tribal lands include the total land covered by 19 Tribal reservations in the county.[5] Military land includes the land covered by the Marine Corps Base Camp Pendleton (referred to as Camp Pendleton). State and other Federally owned lands include public lands, such as State parks, the Cleveland National Forest, and lands owned by the Federal Bureau of Land Management.[6]

[4] County of San Diego General Plan: Chapter 3 – Land Use Element.
[5] University of San Diego: Indian Reservations in San Diego County. In addition to the list, Pechanga Reservation is another tribe with only open space lands (no population) located in San Diego County.
[6] County of San Diego General Plan: Chapter 3 – Land Use Element.

This GHG inventory and projections cover emissions from the unincorporated county, but exclude GHG emissions from tribal and military lands located in the unincorporated county.[7] The emissions from State and other Federally owned lands, which are outside County's land use jurisdiction, are not excluded from this GHG inventory and projections, due to the infeasibility of separating the emissions-generating activities and sources on these lands, which are negligible as State and other Federal lands are predominantly undeveloped, uninhabited, and open space areas. [8]

2.4 Demographics

The San Diego Association of Governments (SANDAG) estimates and forecasts population, housing, and employment for all jurisdictions in the San Diego region, including the unincorporated county. The most recent SANDAG Regional Growth Forecast is the Series 14 Growth Forecast with a base year of 2016. For the 2019 inventory, the County determined that the 2016 modeled housing unit estimates in the SANDAG Forecast reflected the number of dwelling units in 2020 in the unincorporated county, and minimal growth occurred between 2019 and 2020. Therefore, it was assumed the 2016 modeled data also reflects conditions in 2019 for the unincorporated county.[9] The population, housing, and employment modeled forecast selected was based on the SANDAG 2021 Regional Plan Environmental Impact Report (EIR) Alternative 2 growth assumption (DS39 scenario).[10, 11]

SANDAG estimates and forecast for population, housing, and employment include tribal and military population in the unincorporated county. As noted previously, these areas are outside of the County's jurisdiction. Population, housing, and employment from these areas to generate were removed from the SANDAG estimates and forecasts to create adjusted estimates and forecasts specific to the unincorporated areas under the County's jurisdiction. The number of civilian jobs in Camp Pendleton was also excluded from total civilian jobs in the unincorporated county.

2.4.1 Population Estimates and Projections

The population breakdown for the unincorporated county is provided in Table 4. The population used in this document is the unincorporated county population after subtracting the population in the tribal reservations and Camp Pendleton.

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[7] For certain emission categories, the activities from tribal and military lands were not included in the activity data received. The on-road transportation, electricity, and natural gas categories did not include tribal and military data. For water, wastewater, off-road transportation, and solid waste categories, which were estimated on a per capita, per housing or per job basis, it was therefore possible to exclude emissions from tribal and military populations. The exclusion of agriculture emissions into tribal and military emissions was not possible due to the availability of data.

[8] For the key emissions categories: (1) SANDAG's transportation model lacks detail to accurately reflect VMT associated with true uses on open space/park preserve (most federal and state land is coded as "open space/per preserve" in the SANDAG model), personal communication between Ascent and County, May 26, 2023; (2) SDG&E is unable to separate and provide the electricity and natural gas use in those lands, personal communication between EPIC and SDG&E, May 16, 2023, and (3) SANDAG's agricultural land use forecast lacks the granularity to identify the agricultural acreages in these lands, personal communication between EPIC and SANDAG, May 23, 2023.

[9] Fehr & Peers (April 10, 2023), *CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis* [Memorandum].

[10] Fehr & Peers (September 13, 2023), *County of San Diego Climate Action Plan Inventory Transportation Modeling Overview* [Memorandum].

[11] *Climate Action Plan Update - Population, Housing, and Employment Market Capacity Study for the Unincorporated Area*.

Table 4 Population Estimates and Projections (Unincorporated County of San Diego, 2019–2050)

Year	Unincorporated County[12]	Camp Pendleton[13]	Tribal Reservations[14]	Modified Unincorporated County
2016 (Used for 2019)	526,890	40,385	6,661	479,844
2025	537,374	40,385	6,661	490,328
2030	539,701	40,385	6,661	492,655
2035	542,028	40,385	6,661	494,982
2040	545,529	40,385	6,661	498,483
2045	549,030	40,385	6,661	501,984
2050	552,531	40,385	6,661	505,485

2016 estimates are representative of 2019 conditions based on dwelling unit construction in the unincorporated area. 2025, 2035, and 2050 projections are from SANDAG DS39 Scenario. Projections for other years were interpolated linearly.
Modified population = Unincorporated county population less Camp Pendleton and tribal reservation populations.
Fehr & Peers 2023, SANDAG 2022, U.S. Census Bureau, Energy Policy Initiatives Center, University of San Diego 2023

2.4.2 Housing Unit Estimates and Projections

The housing unit breakdown for the unincorporated county is provided in Table 5 (single-family units) and Table 6 (multi-family units). The housing units used in this document are the unincorporated county housing units after subtracting the units in the tribal reservations and Camp Pendleton.

Table 5 Single-family Housing Unit Estimates and Projections (Unincorporated County of San Diego, 2019–2050)

Year	Unincorporated County[15]	Camp Pendleton[16]	Tribal Reservations[17]	Modified Unincorporated County
2016 (Used for 2019)	154,363	7,238	1,838	145,287
2025	158,897	7,238	1,838	149,821
2030	161,184	7,238	1,838	152,108
2035	163,470	7,238	1,838	154,394
2040	164,505	7,238	1,838	155,429
2045	165,540	7,238	1,838	156,464
2050	166,575	7,238	1,838	157,499

2016 estimates are representative of 2019 conditions based on dwelling unit construction in the unincorporated area. 2025, 2035, and 2050 projections are from SANDAG DS39 Scenario. Projections for other years were interpolated linearly.
Modified total = Unincorporated county housing units less Camp Pendleton and tribal reservation housing units.
Fehr & Peers 2023, SANDAG 2022, Energy Policy Initiatives Center, University of San Diego 2023

[12] Base year 2016 estimates, and 2025, 2035, and 2050 projections from the SANDAG DS39 Scenario were developed by Fehr & Peers and provided to EPIC by Ascent, April 10, 2023.
[13] The Camp Pendleton base population was provided to EPIC by SANDAG, February 11, 2022.
[14] U.S. Census Bureau: 2020 Census, downloaded February 7, 2023. The 2020 Census population for the tribal population was used as a proxy for the 2019 tribal population. No population growth is assumed at tribal lands to be consistent with California Department of Finance and SANDAG growth forecast method.
[15] Base year 2016 estimates, and 2025, 2035, and 2050 projections from the SANDAG DS39 scenario were developed by Fehr & Peers and provided to EPIC by Ascent, April 10, 2023
[16] Camp Pendleton Base single-family units were provided to EPIC by SANDAG, February 11, 2022.
[17] Tribal reservation single-family units were provided to EPIC by SANDAG, February 11, 2022.

Table 6 Multi-family Housing Unit Estimates and Projections (Unincorporated County of San Diego, 2019–2050)

Year	Unincorporated County[18]	Camp Pendleton[19]	Tribal Reservations[20]	Modified Unincorporated County
2016 (Used for 2019)	24,628	-	116	24,512
2025	28,434	-	116	28,318
2030	29,841	-	116	29,725
2035	31,247	-	116	31,131
2040	32,106	-	116	31,990
2045	32,966	-	116	32,850
2050	33,825	-	116	33,709
2016 estimates are representative of 2019 conditions based on dwelling unit construction in the unincorporated area. 2025, 2035, and 2050 projections are from SANDAG DS39 Scenario. Projections for other years were interpolated linearly. Modified total = Unincorporated county housing units less Camp Pendleton and tribal reservation housing units. Fehr & Peers 2023, SANDAG 2022, Energy Policy Initiatives Center, University of San Diego 2023				

2.4.3 Employment Estimates and Projections

The employment numbers for the unincorporated county are provided in Table 7. The employment numbers used in this document are the unincorporated county employment values after subtracting the employment numbers in the tribal reservations and Camp Pendleton.

Table 7 Employment Estimates and Projections (Unincorporated County of San Diego, 2019–2050)

Year	Unincorporated County[21]	Camp Pendleton (Civilian Jobs Only)[22]	Tribal Reservations[23]	Modified Unincorporated County
2016 (Used for 2019)	161,065	4,503	17,131	139,432
2025	185,852	4,629	18,165	163,058
2030	196,012	4,792	18,216	173,004
2035	206,171	4,963	18,271	182,937
2040	215,538	5,103	18,304	192,131
2045	224,904	5,230	18,343	201,331
2050	234,271	5,324	18,375	210,572
2016 estimates are representative of 2019 conditions based on dwelling unit construction in the unincorporated area. 2025, 2035, and 2050 projections are from SANDAG DS39 Scenario. Projections for other years were interpolated linearly. Modified employment = Unincorporated county employment less Camp Pendleton and tribal reservation employment. Fehr & Peers 2023, SANDAG 2022, Energy Policy Initiatives Center, University of San Diego 2023				

[18] Base year 2016 estimates, and 2025, 2035, and 2050 projections from SANDAG 2021 Regional Plan EIR Alternative 2 (DS39) were develop by Fehr & Peers and provided to EPIC by Ascent, April 10, 2023.
[19] No multi-family units at Camp Pendleton Base, based on data provided to EPIC by SANDAG, February 11, 2022.
[20] *Id*.
[21] Base year 2016 estimates, and 2025, 2035, and 2050 projections from SANDAG 2021 Regional Plan EIR Alternative 2 (DS39) were developed by Fehr & Peers and provided to EPIC by Ascent, April 10, 2023.
[22] Camp Pendleton civilian jobs only, provided to EPIC by SANDAG, February 11, 2022.
[23] Tribal reservation jobs provided to EPIC by SANDAG, February 11, 2022.

3. Summary of the 2019 GHG Emissions Inventory

The total 2019 GHG emissions from the county, from community-wide activities and sources as well as County operations, were estimated at 2,984,000 metric tons CO_2e (MT CO_2e), distributed into the categories shown in Table 8 and Figure 1. All activity data and GHG emissions reported in this document are annual values, and all emission factors reported in this document are annual average values, unless stated otherwise.

Table 8 Total and Breakdown of 2019 GHG Emissions (Unincorporated County of San Diego, 2019)

Emissions Category	2019 GHG Emissions (MT CO_2e)	Percent of Total (%)
On-road Transportation	1,331,000	45%
Electricity	599,000	20%
Natural Gas	478,000	16%
Waste	193,000	6%
Agriculture	134,000	4%
Propane	121,000	4%
Off-road Transportation	71,000	2%
Water	39,000	1%
Wastewater	18,000	1%
Total	**2,984,000**	**100%**

Percentages may not add up to totals due to rounding.
Energy Policy Initiatives Center, University of San Diego 2023

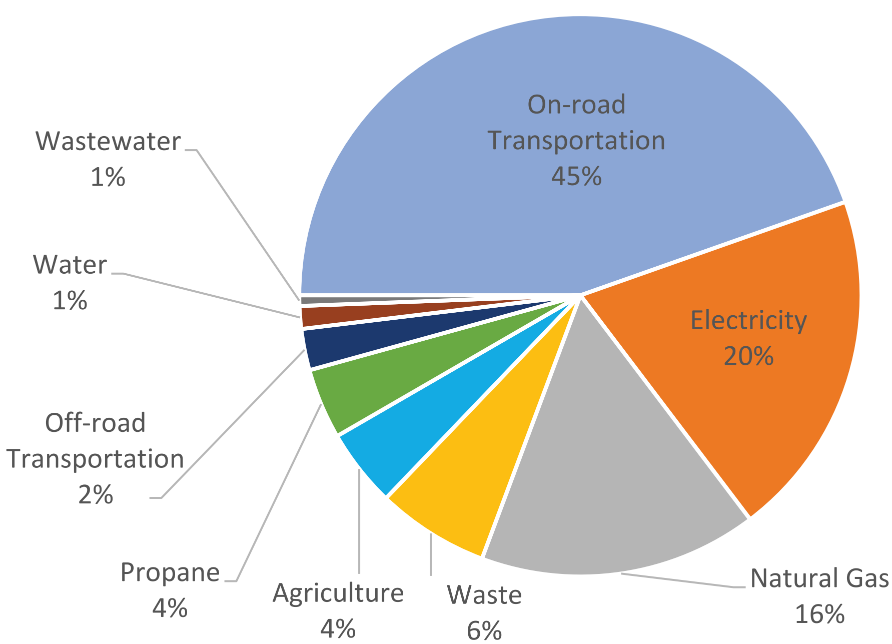

Figure 1 2019 GHG Emissions (Unincorporated County of San Diego, 2019)

4. METHODS TO CALCULATE THE 2019 EMISSIONS INVENTORY

4.1 ON-ROAD TRANSPORTATION

4.1.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from County employee commutes that start and end outside of the unincorporated county, total on-road transportation emissions in 2019 are 1,331,000 MT CO_2e, with County employee commutes resulting in 19,000 MT CO_2e or 1% of all on-road transportation emissions. The inventory and projections report assumes that a majority of County vehicle fleet operations occur in part or fully within the unincorporated county, hence, emissions from County vehicle fleet operations are not added to the community on-road transportation emissions. Additionally, County employee commute emissions that were generated inside the unincorporated county are not added to on-road transportation emissions as doing so would double count emissions already captured in the communitywide VMT estimate (I-I trips). Only County employee commute emissions generated outside of the unincorporated county are added to on-road transportation emissions for estimating combined emissions.

4.1.2 Methods

The emissions associated with on-road transportation were calculated by multiplying the estimated county vehicle miles travelled (VMT) and the average vehicle emission rate in the San Diego region in 2019.

Annual VMT was estimated based on the average weekday VMT for the county provided by SANDAG using the Series 14 Growth Forecast and activity-based model (ABM2+). SANDAG uses ABMs to support development of Regional Plans and generate outputs related to the transportation system performance, including VMT. SANDAG updates the ABM with inputs from the Regional Growth Forecast and performs various model calibrations. Each Regional Growth Forecast is given a new Series number. The most recent forecast is the Series 14 Growth Forecast with a base year of 2016 and the most recent model is ABM2+. SANDAG provided the VMT estimates for 2016. The 2016 modeled housing unit estimates in the SANDAG Forecast reflected the number of dwelling units in the unincorporated county in 2020, and little growth occurred between 2019 and 2020.[24] As a result, SANDAG's modeled VMT estimate for 2016 is used to represent 2019 VMT levels in this GHG emissions inventory. Fehr & Peers adjusted the unincorporated county 2016 VMT provided by SANDAG to exclude military and tribal lands. [25]

SANDAG calculated VMT from ABM2+ for each local jurisdiction in the San Diego region, including the county, using the Origin-Destination (O-D) method.[26] The O-D VMT method is the preferred method in the U.S Community Protocol in *"TR.1 Emissions from Passenger Vehicles"* and *"TR.2 Emissions from*

[24] Fehr & Peers (April 10, 2023), *CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis* [Memorandum].
[25] 2016 VMT file was provide by Fehr & Peers to EPIC, February 13, 2023. SANDAG Activity Based Model 2+ Release v14.2.2, Final 2021 Regional Plan Networks, Policies, and Assumptions, Year 2016, Reference Scenario 458. Fehr & Peers developed a procedure to adjust County VMT provided by SANDAG for the County such that military and tribal lands were not included as part of the unincorporated county. Fehr & Peers (February 17, 2023), *Military and Tribal VMT Adjustment for the San Diego County CAP Model Scenarios* [Memorandum].
[26] SANDAG (2013): Vehicle Miles Traveled Calculation Using the SANDAG Regional Travel Demand Model. Technical White Paper.

Freight and Service Trucks" that estimates miles traveled based on where a trip originates and where it ends to attribute on-road emissions to cities and regions (Figure 2).[27]

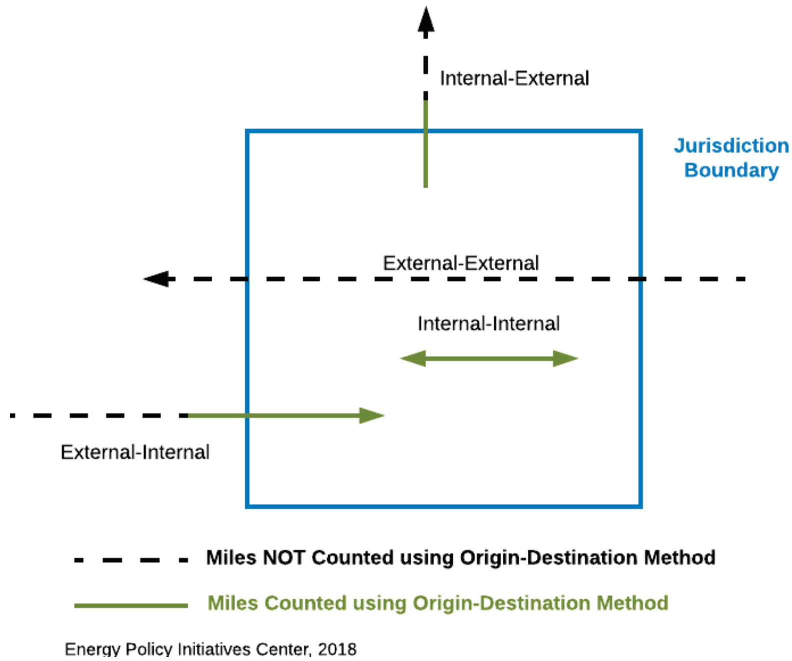

Figure 2 Components of O-D Method for VMT Calculation

O-D VMT allocated to the county includes all miles traveled for trips that originate and end within the County's jurisdictional boundaries (referred to as Internal-Internal), and half of the miles traveled for trips that either begin within the boundaries and end outside the boundaries (referred to as Internal-External), or vice versa (referred to as External-Internal). In accordance with the methodology, miles from trips that begin and end outside the boundaries that only pass through the county (referred to as External-External) are not included in the total county VMT. The total average weekday VMT were multiplied by 347 to adjust from average weekday VMT to average annual VMT, which accounts for travel on weekdays and weekends.[28]

The average weekday O-D VMT estimates for each trip type in 2016, used for 2019, provided by SANDAG, and the total VMT allocated to the county based on the U.S. Community Protocol methodology described above are given in Table 9.

[27] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix D: Transportation and Other Mobile Emission Activities and Sources.
[28] The conversion of 347 weekdays to 365 days per year as used by CARB. CARB: California's 2000–2014 Greenhouse Gas Emission Inventory Technical Support Document (2016 Edition), p. 41 (September 2016).

Table 9 O-D VMT Estimates by Trip Types and Total VMT provided by SANDAG (Unincorporated County of San Diego, 2016 Used for 2019)

Year	VMT by Trip Type (Miles/Weekday)		Total County VMT (100% * I-I + 50% * I-E/E-I) (Miles per Weekday)	Total County VMT (Miles per Year)
	Internal-Internal (I-I) Trips	External-Internal/Internal-External (I-E/E-I) Trips		
2016 (Use for 2019)	1,625,650	14,399,734	8,825,517	3,062,454,359

2016 estimates were representative of 2019 conditions based on dwelling unit construction history in the unincorporated county.

VMT estimates from SANDAG Series 14 (Final 2021 Regional Plan and ABM2+) were adjusted for the County such that military and tribal lands were not included. The conversion factor from miles per weekday to miles per year is 347.

Fehr & Peers 2023, Energy Policy Initiatives Center, University of San Diego 2023

The average annual vehicle emission rate expressed in grams of CO_2e per mile driven (g CO_2e/mile) was derived from the statewide mobile source emissions model EMFAC2021 developed by CARB.[29] EMFAC2021 was run in the default activity mode to generate the total VMT and total vehicle GHG emissions for the San Diego region, which reflects the distribution of all vehicle model years, classes, and fuel types.[30] This GHG emissions inventory assumes that vehicles associated with county VMT had the same distribution of vehicle types as the vehicles in the San Diego region.

Total estimated VMT, the average vehicle emission rate, and corresponding GHG emissions from community-wide on-road transportation from 2019 are given in Table 10.

Table 10 Key Inputs and Community-wide GHG Emissions from On-Road Transportation (Unincorporated County of San Diego, 2019)

Calendar Year	Total County VMT (Miles per Year)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions (MT CO_2e)
2019	3,062,454,359	428	1,312,000

GHG emissions for each category are rounded. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2023.

4.2 Electricity

4.2.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from purchased electricity for County buildings and other facilities and purchased electricity for County airports, total electricity emissions in 2019 are 599,000 MT CO_2e, with purchased electricity for County operations resulting in 19,200 MT CO_2e or 3% of all electricity emissions. Electricity emissions from County airports and government buildings located

[29] CARB: EMission FACtors model, EMFAC2021 v1.0.2, May 2, 2022, and EMFAC Emissions Inventory Web Database: On-Road Emissions.
[30] *Id.*

outside of the unincorporated county are added to the community-wide emissions from electricity use in the county for estimating combined emissions. Electricity emissions from County airports and government buildings located inside the unincorporated county are not added because the inventory and projections report assumes that those emissions are included in the emissions from electricity use in the unincorporated county using data provided by SDG&E.

4.2.2 Methods

Emissions from electricity use in the county were estimated using the *Built Environment (BE.2)* method from the U.S. Community Protocol.[31] The annual metered electricity sales to county customers were adjusted for transmission and distribution losses, and multiplied by the electricity emission factor, expressed in pounds of CO_2e per megawatt-hour (lbs CO_2e/MWh).

The local utility, San Diego Gas & Electric (SDG&E), provided the 2019 electricity sales to county customers by bundled and Direct Access (DA) supply for each customer class.[32] The electricity sales did not include: (1) any tribal reservation residential accounts, casinos or resorts; and (2) Camp Pendleton Marine Corps Base accounts. The transmission and distribution loss factor, 1.082, is the loss estimate for the entire SDG&E service territory (larger than San Diego region) and accounts for the loss between electricity generated for load and electricity sales.[33]

SDG&E and electric service providers (ESPs) for DA customers have different power mixes in their electricity supplies. The SDG&E 2019 bundled emission factor, 633 lbs CO2e/MWh, was calculated using the Federal Energy Regulatory Commission (FERC) Form 1 data, the California Energy Commission (CEC) Power Source Disclosure Program data on SDG&E-owned and purchased power, and EPA's Emissions and Generating Resource Integrated Database (eGRID) on specific power plant emissions.[34] In 2019, SDG&E had 31% renewables in its power mix and 7.8% of retail sales covered by retired unbundled renewable energy credits not reflected in the power mix.[35]

The DA emission factor, 836 lbs CO2e/MWh, is a default from the California Public Utilities Commission Decision 14-12-037.[36]

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[31] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix C: Built Environment Emission Activities and Sources.

[32] 2017–2019 aggregated metered electricity sales were provided by SDG&E to EPIC (March 1, 2021). SDG&E's bundled customers are those who receive both electric generation and electric delivery service from SDG&E (bundled service). Direct Access customers receive electric generation from an Electric Service Provider (not SDG&E), but electricity is delivered by SDG&E. SDG&E: Customer Choice Service Types.

[33] The loss factor is from the California Energy Commission's Energy Demand 2019 Forecast. For each forecast cycle, utilities provide the estimates, which remain relatively stable. Personal communication with CEC staff. March 23, 2020.

[34] FERC: Form 1- Electricity Utility Annual Report, report year 2019, downloaded on November 10, 2020. CEC: Power Source Disclosure Program. SDG&E 2019 power source disclosure report was provided by CEC staff to EPIC (August 3, 2020). U.S. EPA: eGRID 2019, released on February 23, 2021, downloaded on April 13, 2021.

[35] CEC: SDG&E 2019 Power Content Label (Version October 2020). Unbundled renewable energy credits, the renewable generation that was not delivered to serve retail sales, are not reflected in the power mix or GHG emissions intensity calculation based on the Regulations governing the Power Source Disclosure Program (effective May 4, 2020)

[36] Decision 14-12-037, December 18, 2014 in Rulemaking 11-03-012 (Filed March 24, 2011). The recommended emission factor is 0.379 MT CO_2e/MWh (836 lbs CO_2e/MWh).

The key inputs and GHG emissions from community-wide electricity in 2019 are shown in Table 11. In 2019, 56% of community-wide electricity emissions (322,000 MT CO_2e) were from the residential sector; and the remaining 44% of community-wide electricity emissions (257,000 MT CO_2e) were from the non-residential sector.

Table 11 Key Inputs and GHG Emissions from Electricity (Unincorporated County of San Diego, 2019)

Year	Electricity Sales - Bundled + DA (MWh)*	Transmission and Distribution Loss Factor	County-Specific Electricity Emission Factor (lbs CO_2e/MWh)	GHG Emissions (MT CO_2e)
2019	1,830,397	1.082	645	579,000
*Does not include sales to (1) any tribal reservation residential accounts, casinos or resorts; and (2) Camp Pendleton Marine Corps Base GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2021				

4.3 Natural Gas

4.3.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from purchased natural gas for County buildings and other facilities and purchased natural gas for County airports, total natural gas emissions in 2019 are 478,000 MT CO_2e, with purchased natural gas for County operations resulting in 9,000 MT CO_2e or 2% of all natural gas emissions. Emissions from natural gas consumption at County airports and government building located outside of the unincorporated county are added to the emissions from natural gas end-use in the county for estimating combined emissions. Natural gas emissions from County airports and government buildings located inside the unincorporated county are not added because the inventory and projections report assumes that those emissions are included in the emissions from natural gas use in the county using data provided by SDG&E.

4.3.2 Methods

Emissions from natural gas end-use in the county were estimated using method *Built Environment (BE.1)* from the U.S. Community Protocol.[37] Natural gas end-use does not include the natural gas used for utility-level electric generation (UEG) because those emissions are included in the electricity category. SDG&E provided the annual natural gas sales to county customers. The natural gas sales do not include: (1) any tribal reservation residential accounts, casinos or resorts; (2) Camp Pendleton Marine Corps Base; and (3) natural gas use for UEG.[38]

To estimate emissions from natural gas end use, fuel use was multiplied by an emission factor for natural gas based on data from the CARB.[39] The key inputs and GHG emissions from community-wide natural gas in 2019 are shown in Table 12. In 2019, 42% of the community-wide natural gas end-use emissions (196,000 MT CO_2e) were from the residential sector; and the remaining 58% (23,000 MT CO_2e) were from the non-residential sector.

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[37] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix C: Built Environment Emission Activities and Sources.
[38] 2017–2019 aggregated metered natural gas sales were provided by SDG&E to EPIC (March 1, 2021).
[39] Emission factor for natural gas: 0.0545 million metric tons CO_2e/million therm. CARB: Documentation of California's 2000–2018 GHG Inventory, last modified November 6, 2020.

Table 12 Key Inputs and GHG Emissions from Natural Gas (Unincorporated County of San Diego, 2019)

Calendar Year	Natural Gas Use* (Therms)	Natural Gas Emission Factor (MT CO_2e per Therm)	GHG Emissions (MT CO_2e)
2019	86,039,213	0.00545	469,000
*Does not include sales to (1) any tribal reservation residential accounts, casinos or resorts; and (2) Camp Pendleton Marine Corps Base GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2021			

4.4 Waste

4.4.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from landfill decomposition of solid waste generated at County buildings and facilities and emissions from closed landfills operated by the County that are located outside of the unincorporated county, total waste emissions in 2019 are 193,000 MT CO_2e, with County operations resulting in 22,000 MT CO_2e or 11% of all waste emissions. For combined emissions, all emissions from solid waste disposal in County facilities and emissions from landfills operated by the County but located outside of the unincorporated county are added to community-wide solid waste emissions. Emissions from landfills operated by the County and located inside the unincorporated county are not added because those emissions are included in the community solid waste emissions.

4.4.2 Methods

Emissions from the decomposition of organic material in waste disposed at landfills are broken down into two parts in the solid waste category: (1) CH_4 emissions from county-generated mixed waste in 2019, discussed in Section 4.4.1 ; and (2) CH_4 emissions from biodegradable waste that has been placed at landfills located within the County as of 2019, discussed in Section 4.4.2.[40] The total community-wide emissions from waste are provided in Table 13.

Table 13 Community-wide GHG Emissions from Waste (Unincorporated County of San Diego, 2019)

Calendar Year	Emissions from County Waste Disposal (MT CO_2e)	Emissions from In-Boundary Landfills (MT CO_2e)	Total Emissions from Waste (MT CO_2e)
2019	73,641	97,557	171,000
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2021			

[40] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix E: Solid Waste Emission Activities and Sources - SW.1 Methane Emissions from Landfills and SW.4 community-Generated Waste Sent to Landfills.

4.4.3 Emissions from County Waste Disposal

This sub-category includes emissions from total waste disposed of in 2019 by county residents and businesses regardless of whether the landfills accepting the waste were inside or outside the County boundary. These emissions from waste disposal in the year 2019 were estimated using method *SW.4 Community-Generated Waste Sent to Landfills*, in the U.S. Community Protocol, based on waste generated by a community in a year and an emissions factor for mixed solid waste.

The 2019 waste disposal data reported to California Department of Resources Recycling and Recovery (CalRecycle) was modified to exclude the waste disposal from military lands. Waste disposal from Camp Pendleton Marine Base, sent to Las Pulgas and San Onofre landfills, was subtracted from the total. Waste disposal from tribal lands to Sycamore and Otay Landfills were not included in the total county tonnage reported to CalRecycle. In 2019, San Onofre Landfill did not accept any waste, however, the Landfill is not closed. The resulting waste disposal amount in 2019 is shown in Table 14.

Table 14 Modified Waste Disposal (Unincorporated County of San Diego, 2019)

Calendar Year	Waste Disposal from County Reported to CalRecycle (Short tons)	Waste Disposal at Las Pulgas Landfill* (Short tons)	Modified Waste Disposal from County (Short tons)
2019	522,021	24,744	497,277
*Disposal from Camp Pendleton was subtracted from total waste disposal to obtain the modified waste disposal amount County of San Diego 2021			

Because a waste composition study conducted for the county is not available, 2014 residential and commercial waste composition estimates from CalRecycle for the unincorporated county were used.[41] The EPA Waste Reduction Model (WARM) is used to determine the emission factor of each waste type. WARM is a life-cycle GHG model to assess and compare waste management options (e.g., landfilling, recycling, source reduction, composting), through the lifecycle of waste materials (from material extraction to disposal). However, pursuant to the U.S. Community Protocol, only emissions from the disposal and associated degradation of waste are included. Therefore, only the landfill emission factors in EPA WARM are used in the calculation. WARM reports the landfill CH_4 emission factor of each waste material in MT CO_2e/short ton, with and without Landfill Gas (LFG) recovery.

The mixed solid waste emission factor Is given in Table 15.[42] The landfill emission factors without LFG recovery are identified here; and the LFG recovery is applied later in the total emission calculation. The mixed waste emission factor is multiplied by the total waste disposed from the unincorporated county to calculate the total emissions without LFG recovery. The landfills in the San Diego region have LFG capture systems at the facilities. The LFG capture rate was assumed to be 85% based on San Diego Air Pollution Control District's landfill emissions reporting instructions, with a 10% oxidization rate based on the U.S. Community Protocol.[43] The emissions from county-generated waste are provided in Table 16.

[41] CalRecycle: Solid Waste Characterization Home. Based on a 2014 statewide waste study, materials for business grounds and residential stream, Unincorporated County of San Diego, downloaded April 13, 2021. California has a statewide 2018 waste characterization study, however, no jurisdictional estimates are available.
[42] EPA: Current WARM Tool – Version 15 (November 2020 Version), downloaded April 19, 2021.
[43] San Diego Air Pollution Control District: Emissions Inventory Request Instructions, accessed March 24, 2023. ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix E: Solid Waste Emission Activities and Sources - SW.1 Methane Emissions from Landfills and SW.4 Community-Generated Waste Sent to Landfills.

Table 15 Mixed Solid Waste Emission Factor (Unincorporated County of San Diego)

Material Class	2014 Waste Characterization Study - Unincorporated County Distribution		Landfills without LFG Recovery ($MT\ CO_2e/ton$)
	Commercial	Residential	
Electronics	0.8%	1.1%	No Landfill Emissions
Glass	3%	2.0%	No Landfill Emissions
Household Hazardous Waste (HHW)	0.2%	0.6%	No Landfill Emissions
Inerts and Other	10%	13.8%	-
Asphalt Paving	*0.2%*	*0%*	*No Landfill Emissions*
Asphalt Roofing	*0.2%*	*0.7%*	*No Landfill Emissions*
Clean Dimensional Lumber	*1%*	*2.4%*	*0.15*
Clean Engineered Wood	*0.4%*	*1.4%*	*0.15*
Clean Pallets & Crates	*3%*	*0.7%*	*0.15*
Concrete	*1%*	*1.0%*	*No Landfill Emissions*
Gypsum Board	*0.5%*	*0.3%*	*No Landfill Emissions*
Other Wood Waste	*2%*	*4.1%*	*0.15*
Remainder/Composite Inerts and Other	*1.4%*	*0.8%*	*No Landfill Emissions*
Rock, Soil and Fines	*1%*	*2.5%*	*No Landfill Emissions*
Metal	3%	2.8%	No Landfill Emissions
Mixed Residue	1%	4.2%	0.53
Other Organic	43%	44.9%	-
Branches and Stumps	1%	2.3%	1.3
Carpet	1%	1.7%	No Landfill Emissions
Food	26%	19.1%	1.62
Leaves and Grass	4%	6.3%	0.55
Manures	0.1%	0%	No Landfill Emissions
Prunings and Trimmings	2%	5.6%	0.73
Remainder/Composite Organic	6%	5.4%	1.05
Textiles	3%	4.6%	1.05
Paper	25%	17.9%	-
Magazines and Catalogs	0.7%	0.7%	1.08
Newspaper	2.6%	1.9%	0.94
Other Miscellaneous Paper - Compostable	0.4%	0.2%	3.5
Other Miscellaneous Paper - Other	3.4%	4.1%	3.5
Other Office Paper	1.3%	0.5%	3.5
Paper Bags	0.4%	0.2%	2.36
Phone Books and Directories	0%	0%	0.94
Remainder/Composite Paper - Compostable	9%	7.6%	2.41
Remainder/Composite Paper - Other	2.8%	0.7%	2.41
Uncoated Corrugated Cardboard	2.9%	1.7%	2.36
White Ledger Paper	1.2%	0.3%	3.5
Plastic	13%	9.3%	No Landfill Emissions
Special Waste	2%	3.4%	No Landfill Emissions
Mixed Waste Emission Factor	**1.21**	**1.00**	**1.10**

The mixed waste emission factor was calculated based on the distribution of commercial and residential waste (47% and 53%, respectively) and their emission factors.
CalRecycle, EPA 2020, Energy Policy Initiatives Center, University of San Diego 2021

Table 16 Emissions from Waste Disposal (Unincorporated County of San Diego, 2019)

Calendar Year	Waste Disposed (Short Tons)	Mixed Waste Emission Factor (MT CO_2e/short Ton)	Oxidation Rate	Total GHG Emissions (MT CO_2e)	San Diego Regional Landfill CH_4 Capture Rate	Remaining GHG Emissions (MT CO_2e)
2019	497,277	1.10	10%	490,943	85%	73,641
Energy Policy Initiatives Center, University of San Diego 2021						

4.4.4 Emissions from In-Boundary Landfills

This sub-category includes the emissions from active and closed landfills within the County boundary, regardless of where the waste was generated, in accordance with method *SW.1 Methane Emissions from Landfills* in the U.S. Community Protocol.

The active landfills within the County boundary are Borrego Landfill and Otay Landfill. Otay Landfill is required to report annual emissions at the landfill through EPA's Greenhouse Gas Reporting Program (EPA MRR).[44] To avoid double counting with county-generated waste emissions, emissions from the Otay Landfill in 2019 were the emissions reported under EPA MRR (90,594 MT CO_2e) minus emissions from county waste disposed in 2019 estimated using CARB's Landfill Gas Tool (LGT, 395 MT CO_2e).[45] The Borrego Landfill is not subject to EPA MRR reporting, therefore, the LGT and the historical waste-in-place at the Landfill were used to estimate its 2019 emissions. Similarly, 2019 county-generated waste disposed at Borrego Landfill was not included in LGT to avoid double counting. The LGT does not include adjustments for landfill gas collection. The default values for the percent of anaerobically degradable carbon (ANDOC) in California were used in the LGT. GWPs from IPCC's Second Assessment Report (SAR) are embedded in the LGT, therefore the CO_2e landfill emissions output from the LGT was modified using GWPs from IPCC AR4 instead of the IPCC SAR, to be consistent with the rest of the document.[46] The emissions from active landfills are shown in Table 17.[47]

Table 17 Emissions from Active Landfills (Unincorporated County of San Diego, 2019)

Active Landfill	2019 Emissions (MT CO_2e)
Borrego Landfill	2,011
Otay Landfill – Modified*	90,199
Total Active Landfills	**92,210**
*Emissions reported under EPA MRR for Otay Landfill (90,594 MT CO_2e) were modified to remove emissions in 2019 from county's 2019 waste disposal there (395 MT CO_2e). Energy Policy Initiatives Center, University of San Diego 2023	

The closed landfills within the County boundary are Bonsall, Jamacha, Valley Center, and Viejas Landfills.[48] Other County-operated closed landfills outside the unincorporated county boundary are accounted for in the County's operations inventory. CH_4 and N_2O emissions for Bonsall, Jamacha, and Valley Center landfills were available from the County's Climate Reporting Information System (CRIS) reports.

[44] EPA: Greenhouse Gas Reporting Program, Otay Landfill 2019 emissions data downloaded on April 16, 2021.
[45] CARB: Landfill Gas Tool (updated September 24, 2021).
[46] The SAR GWP for CH_4 is 21, and the AR4 GWP for CH_4 is 25.
[47] The 1990–2019 waste disposal and 2000–2019 average daily cover (ADC) disposal at Otay Landfill, and 1990–2018 waste disposal and 2000–2009 ADC disposal at Borrego Landfill were downloaded from CalRecycle, April 19, 2021.
[48] Landfills with Gas Systems Data for San Diego County. County of San Diego Department of Public Works Inactive Waste Division. October 14, 2015.

CRIS reports fugitive, pilot light, and flared gas emissions for the Bonsall, Jamacha, and Valley Center landfills. For Viejas Landfill, the emissions were calculated using the LGT. The emissions from closed landfills are shown in Table 18.[49]

Table 18 Emissions from Closed Landfills in the Unincorporated County (Unincorporated County of San Diego, 2019)

Closed Landfill	2019 Emissions (MT CO_2e)
Bonsall Landfill	2,031
Jamacha Landfill	1,947
Valley Center Landfill	866
Viejas Landfill	503
Total Closed Landfills	**5,347**
County of San Diego 2021, Energy Policy Initiatives Center, University of San Diego 2023	

4.4.5 Emissions from Out-of-Boundary Landfills

This sub-category includes emissions from active and closed landfills located outside of the unincorporated county boundary which are operated by the County. However, out-of-boundary landfills only include landfills that are closed, as the County does not own or operate any active landfills. The closed landfills outside the County boundary are San Marcos, Poway, Palomar, Hillsborough, Gillespie, Encinitas, and Bell Junior High. Emissions from these landfills including emissions from purchased electricity, natural gas, fugitive emissions, pilot light, and flared gas are reported in the County's 2019 Local Government Operations GHG Inventory and Projections Report. The emissions from out-of-boundary landfills are shown in Table 19.

Table 19 Emissions from Landfills outside Unincorporated County (Unincorporated County of San Diego, 2019)

Out-of-Boundary Landfill	2019 Emissions (MT CO_2e)
San Marcos Landfill	9,484
Poway	4,821
Palomar	4,821
Hillsborough	726
Gillespie	1,189
Encinitas	1,707
Bell Junior High Landfill	555
Total Out-of-Boundary Landfills	**23,304**
Ascent Environmental, 2023	

[49] Emissions from CRIS were provided by County, April 22, 2021. The 1971–1979 waste disposal at Viejas Landfill are downloaded from CalRecycle, April 19, 2021.

4.5 PROPANE

4.5.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from purchased propane for County buildings and other facilities and purchased propane for County airports, total propane emissions in 2019 are 121,000 MT CO_2e, with purchased propane for County operations resulting in negligible GHG emissions. Propane emissions from County operations are generated from the use of propane in airports and government buildings located outside of the unincorporated county. Emissions generated from the use of propane in airports and government buildings located inside the unincorporated county are not added because these emissions are included in the emissions from propane end-use in the unincorporated county.

4.5.2 Methods

Emissions from propane end-use in the county were estimated using *Built Environment (BE.1)* from the U.S. Community Protocol and CARB statewide inventory.[50]

Unlike natural gas end-use, propane end-use data are not available from SDG&E. SDG&E's current natural gas infrastructure, as shown in Figure 3, does not cover the eastern two-thirds of the San Diego region, where much of the county is located.[51]

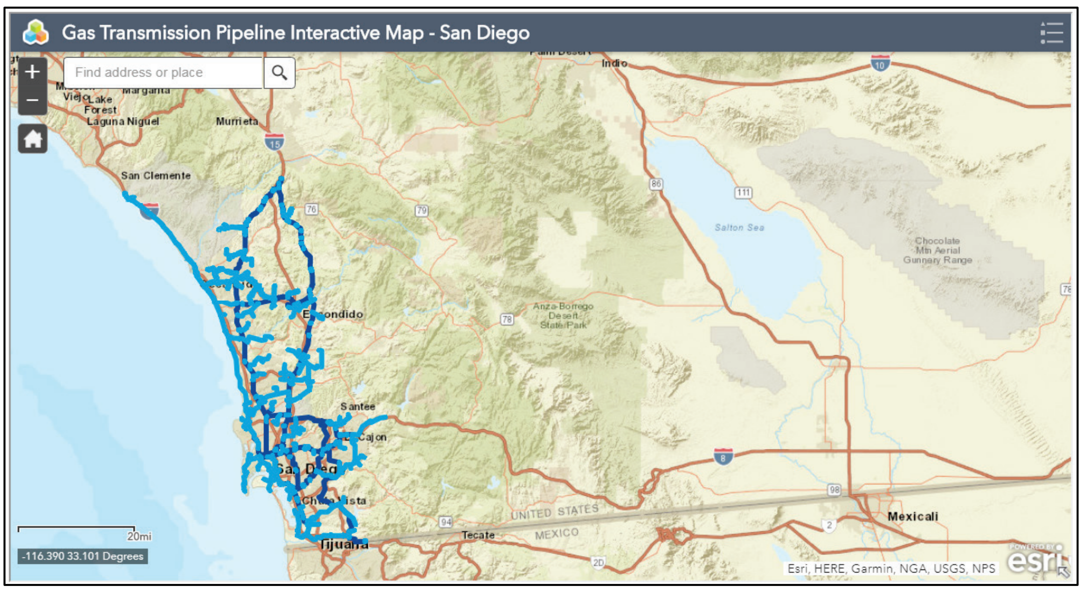

Figure 3 SDG&E High Pressure Gas Pipeline Map (Screenshot from SDG&E Website, Dark Blue: Transmission Pipeline, Light Blue: High Pressure Gas Distribution Main)

While Figure 3 does not indicate the actual extent to which natural gas is available through SDG&E service territory, for the residential sector, it is assumed that all households in San Diego region using propane as a heating fuel are in the unincorporated county.

[50] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix C: Built Environment Emission Activities and Sources.
[51] SDG&E: High Pressure Gas Pipeline Map.

The estimated number of households in San Diego region using propane as the heating fuel, and the space and water heating fuel amounts were provided by the Propane Education & Research Council (PERC) and shown in Table 20.[52]

Table 20 Propane End-Use in Residential Sector (Unincorporated County of San Diego, 2019)

Year	Number of Households Using Propane as Space Heating Fuel	Propane Use for Space Heating (Gallons)	Propane Use for Water Heating (Gallons)	Total Residential Propane Use (Gallons)
2019	38,275	15,442,000	3,235,811	18,677,811
It is assumed that all households in San Diego region using propane as the heating fuel are in the unincorporated county based on the SDG&E's natural gas infrastructure layout in Figure 3. Propane Education & Research Council, 2021				

For non-residential sectors, the California statewide retail propane sales by sector were allocated to San Diego region, then to the county, based on demographic and economic attributes in each sector, as shown in Table 21.[53]

Table 21 Propane End-Use in Non-Residential Sectors (2019)

Sector	California Retail Propane Sales (Million Gallons)	Allocation Factor	San Diego Region to California Ratio	Unincorporated County to San Diego Region Ratio	Unincorporated County Propane Use (Gallons)
Commercial	145	Commercial Jobs Ratio	9%	9%	1,073,451
Industrial	12	Manufacturing Jobs Ratio	9%	9%	91,403
Agricultural	51	Agricultural Land Ratio	2%	88%	1,029,457
				Non-residential Total	**2,194,310**
Propane Education & Research Council, 2020, Energy Policy Initiatives Center, University of San Diego 2023					

[52] 2010–2019 residential space heating (number of households), residential space heating demand propane equivalent, residential water heating demand propane equivalent in San Diego County (San Diego region) were provided to EPIC by the Propane Education & Research Council, PERC, April 2, 2021. PERC worked with each state propane agency to review and verify the list of propane retailers, collected the retail propane sales volumes from the retailers through a survey-based approach, and verified the data with the retailers and additional data sources. PERC: Annual Retail Propane Sales Report, Reporting Year 2019 (December 2020), pg. 23–29, accessed on April 21, 2021.

[53] PERC: Annual Retail Propane Sales Report, Reporting Year 2019 (December 2020), accessed on April 21, 2021. California Employment Development Department: 1990–2020 Employment by Industry Data, estimates through March 2021, accessed on April 21, 2021. In 2019, the total number of manufacturing jobs are 1,326,800 and 115,700 for statewide and San Diego region (San Diego County MSA), respectively. The total number of commercial (non-farm) jobs are 17,460,400 and 1,503,200 for statewide and San Diego region, respectively. The total number of agricultural (farm) jobs are 42,700 to 9,700 for statewide and San Diego region, respectively. The Unincorporated County to San Diego jobs region ratio was based on 2019 jobs estimates discussed in Section 2.4 and SANDAG Series 14 Growth Forecast (interpolated between 2018 estimates and 2020 forecast), downloaded from SANDAG Data Surfer, January 22, 2023. The agricultural land acreage projections (114,746 acres in the Unincorporated County, and 130,488 acres in the San Diego region) were based on SANDAG Series 14 Growth Forecast, provided by SANDAG to EPIC, August 31, 2022. As 2019 data were not available, 2025 agricultural land ratio was used as a proxy for 2019. In the SANDAG Land Use Codes, agricultural land includes orchard, vineyard, intensive agriculture, and field crops.

To estimate emissions from propane end-use, the sum of the residential and non-residential propane fuel use was multiplied by an emission factor for propane from CARB.[54] The key inputs and GHG emission from propane in 2019 are show in Table 22.

Table 22 Key Inputs and GHG Emissions from Propane (Unincorporated County of San Diego, 2019)

Year	Propane Use (Gallons)	Propane Emission Factor (Gram CO_2e per Gallon)	GHG Emissions (MT CO_2e)
2019	20,872,121	5,819	121,000
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2021			

4.6 Agriculture

4.6.1 Combined Emissions – Community-wide and County Operations

The GHG emissions from agriculture are broken down into four categories: agricultural equipment, enteric fermentation, manure management, and soil management. The total emissions from the agriculture sector are 134,000 MT CO_2e as shown in Table 23. The inventory for County operations emissions does not include any agricultural activities.

Table 23 GHG Emissions from Agriculture (Unincorporated County of San Diego, 2019)

Agricultural Emissions Category	GHG Emissions (MT CO_2e)
Agricultural Equipment	66,144
Enteric Fermentation	28,645
Manure Management	26,798
Soil Management	12,244
Total	**134,000**
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2022	

Methods used to estimate emissions from each category are provided in Section 4.6.1 to Section 4.6.5.

4.6.2 Agriculture Equipment

Off-road mobile agriculture equipment, including diesel- and gasoline-fuel equipment, contributes to GHG emissions from the fuel combustion. CARB released the 2021 Agricultural Equipment Emissions Inventory with the latest available data on farm acreage, equipment population, activity, and overall sector fuel consumption.[55] The results were incorporated into OFFROAD2021, an online emissions inventory database for off-road equipment and vehicles, discussed in more detail in Section 4.7 Off-Road Transportation. The 2019 emissions from agricultural equipment are shown in Table 24, and not included in Section 4.7 Off-Road Transportation.[56]

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[54] CARB: Documentation of California's 2000–2018 GHG Inventory, last modified November 6, 2020. 1A4b – Fuel Combustion – LPG. The propane emission factor is a constant.

[55] CARB: 2021 Agriculture Equipment Emission Inventory (August 2021). The types of agriculture equipment are shown in Table 16 of the CARB 2021 Agriculture Equipment Inventory.

[56] OFFROAD2021 v1.0.3 data were downloaded from CARB EMFAC database on August 23, 2022. Emissions in San Diego County (San Diego region) in CARB models were given in tons per day and converted to metric tons per year.

Table 24 GHG Emissions from Agriculture Equipment (Unincorporated County of San Diego, 2019)

Emissions Category	GHG Emissions ($MT\ CO_2e$)
San Diego Region - Agricultural Equipment (Diesel)	72,675
San Diego Region - Agricultural Equipment (Gasoline)	2,521
San Diego Region - Agricultural Equipment (Total)	75,195
Ratio of Agriculture Land Acreage – Unincorporated County to San Diego Region	88%
Unincorporated County of San Diego - Agricultural Equipment (Total)	66,144
CARB OFFROAD2021 v1.0.3 integrates data from the 2021 Agriculture Equipment Emission Inventory. Agricultural land acreages in the unincorporated county do not include the rural residential areas that may have small orchards or fields on the land. CARB 2022, Energy Policy Initiatives Center, University of San Diego 2022	

4.6.3 Diesel Irrigation Pumps

The agriculture equipment in Section 4.6.1 above is from the CARB 2021 Agriculture Equipment Inventory. Agricultural pumps, as stationary sources, are not included in the CARB 2021 Agriculture Equipment Inventory, because the Inventory covers self-propelled/mobile sources only. The San Diego Air Pollution Control District, which handles stationary source permits, was not able to isolate and provide agriculture diesel pump permit information from its database, therefore, agricultural pumps are not included in this report.[57]

4.6.4 Enteric Fermentation

The GHG emissions from enteric fermentation, a process that occurs in the stomach of ruminant animals that produces and releases CH_4, were estimated using method *A.1, Enteric Fermentation from Domesticated Animal Production*, from the U.S. Community Protocol.[58] This method multiplies animal-specific CH_4 emission factors with the specific livestock population to estimate the total emissions from enteric fermentation.

The livestock population was obtained from the 2019 Crop Statistics and Annual Report for the San Diego region.[59] For the animal types that were not reported in the 2019 Crop Statistics and Annual Report, livestock populations were estimated based on the population distribution in the National Agriculture Statistics Service (NASS).[60] Animal-specific CH_4 emission factors in California were obtained from the EPA 2019 U.S. Greenhouse Gas Inventory Report.[61]

The agricultural land acreage projections (114,746 acres in the Unincorporated County, and 130,488 acres in the San Diego region) are based on SANDAG Series 14 Growth Forecast, provided by SANDAG to EPIC, August 31, 2022. As 2019 data were not available, the 2025 agricultural land ratio was used as a proxy for 2019. In the SANDAG Land Use Codes, agricultural land includes orchards, vineyards, intensive agriculture, and field crops.

[57] Based on the response to a public records request submitted by EPIC, September 8, 2022.

[58] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019). Appendix G: Agricultural Livestock Emission Activities and Sources.

[59] County of San Diego Department of Agriculture, Weights and Measures. 2019 Crop Statistics and Annual Report, accessed May 10, 2021.

[60] United States Department of Agriculture (USDA): National Agricultural Statistics Service. 2014–2020, goats, hogs, sheep inventory, San Diego County, downloaded January 14, 2021.

[61] EPA: Annexes to the Inventory of U.S. GHG Emissions and Sinks 1990–2019 (April 2021), accessed June 10, 2021. Table A-159 Emission Factors for Cattle by Animal Type and State, and Table A-162 Emission Factors for Other livestock. CARB's California statewide inventory refers to the EPA U.S. GHG Emissions Inventory for the California emission factors.

The San Diego regional enteric fermentation emissions were then scaled to the unincorporated county based on the ratio of agricultural land acreage in the unincorporate county to the region. Livestock population in the San Diego region, animal-specific CH_4 emission factors, and emissions from enteric fermentation are provided in Table 25.[62]

Table 25 GHG Emissions from Enteric Fermentation (Unincorporated County of San Diego, 2019)

Animal Type	Population (Head)	Emission Factor (kg CH_4/head/year)	GHG Emissions (MT CO_2e)
Dairy Cow	4,300	146	15,695
Beef Cow	3,700	100	9,250
Other Cattle	5,200	54	7,033
Sheep and Lamb	960	9	216
Goats	1,391	9	313
Hogs and Pigs	1,558	1.5	58
San Diego Region - Total			32,565
Ratio of Agriculture Land Acreage – Unincorporated County to San Diego Region			88%
Unincorporated County of San Diego - **Total**			28,645
Agricultural land acreages in the unincorporated county do not include rural residential areas that may have small orchards or fields on the land. County of San Diego, USDA, EPA 2021, Energy Policy Initiatives Center, University of San Diego 2022			

4.6.5 Manure Management

Manure, the natural byproduct of livestock, creates both CH_4 and N_2O emissions as it biodegrades. The emissions from manure management, including from stabilizing and storing manure, were estimated using method A.2.1 (CH_4), A.2.3 (direct N_2O), and A.2.4 (indirect N_2O) from the U.S. Community Protocol.[63] These methods use a combination of livestock population, animal type, and animal-specific manure management systems to estimate the emissions from manure management.

Livestock population and the type are the same as discussed in Section 4.6.3 Enteric Fermentation above. Animal-specific manure management systems in California were obtained from the EPA 2019 U.S. Greenhouse Gas Inventory Report for each animal type.[64] The sub-sections below describe emissions estimation methods for manure management by emission type CH_4 and N_2O, and the total emissions from manure management, combining CH_4, direct N_2O, and indirect N_2O emissions, are provided in Table 26. The San Diego regional manure management emissions were then scaled to the unincorporated county based on the ratio of agricultural land acreage in the unincorporate county to the region.

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[62] The number of sheep and lamb, and the number of hogs and pigs are from the County 2019 Crop Statistics and Annual Report. The number of dairy cows, beef cows, and other cattle are from the USDA inventory. The number of goats is based on the number of sheep and lamb from County report, and the ratio of sheep and lamb to goat in the USDA inventory. The CH_4 emission factor for other cattle was the average of emission factors for cattle types except dairy cows and beef cows.
[63] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019). Appendix G: Agricultural Livestock Emission Activities and Sources.
[64] EPA: Annexes to the Inventory of U.S. GHG Emissions and Sinks 1990–2019 (April 2021), accessed June 10, 2021.

Table 26 GHG Emissions from Manure Management (Unincorporated County of San Diego, 2019)

Animal Type	Population	CH_4 Emissions (MT CO_2e)	Direct N_2O Emissions (MT CO_2e)	Indirect N_2O Emissions (MT CO_2e)	Total GHG Emissions (MT CO_2e)
Dairy Cow	4,300	21,375	696	1,062	23,132
Beef Cow	3,700	745	2,050	268	3,062
Other Cattle	5,200	294	2,701	353	3,348
Sheep and Lamb	960	14	24	3	41
Goats	1,391	13	13	1	27
Hogs and Pigs	1,558	416	416	22	855
San Diego Region - Total					30,465
Ratio of Agriculture Land Acreage – Unincorporated County to San Diego Region					88%
Unincorporated County of San Diego - Total					26,798
Agricultural land acreages in the unincorporated county do not include the rural residential areas that may have small orchards or fields on the land. County of San Diego, USDA, EPA 2021, Energy Policy Initiatives Center, University of San Diego 2022					

4.6.5.1 CH_4 Emissions from Manure Management

Under method A.2.1, CH_4 emissions from manure management, the amount of methane produced depends on the type of animal, the animal's diet and the manure management system. The types and distribution of manure management system for each animal type are shown in Table 24 and Table 25. Methane emissions from each management system for each animal population is calculated separately, by multiplying the maximum CH_4 producing capacity per pound of manure with the CH_4 conversion factor for each management system. The maximum CH_4 producing capacity depends on the volatile solids in manure managed. For cattle, the amount of volatile solids produced is based on the number of cattle; for other animals, it is based on animal weight. The CH_4 emissions from cattle are shown in Table 27;[65] and the CH_4 emissions from other animals are shown in Table 28.[66]

[65] ICLEI Community Inventory Appendix G, Equation A.2.1.1a, A.2.1.1b, and A.2.1.2. For dairy cows and beef cows, distribution of manure by the waste management system is from the EPA report Table A-171; for other cattle, the distribution is from CARB's 2000–2018 GHG inventory, 3A2aii – Other Cattle. CH_4 conversion factors by waste management systems are from CARB's 2000–2019 GHG inventory, 3A2d – dairy cows. The CH_4 conversion factors are not available, and the default values from Table A.2.1.2 and Table A.2.1.3 in the ICLEI Community Inventory Appendix G were used.

[66] ICLEI Community Inventory Appendix G, Equation A.2.1.1a, A.2.1.1b, and A.2.1.2. For sheep and goats, the distribution of manure and CH_4 conversion factor by waste management system and CH_4 are from CARB's 2000–2018 GHG inventory, 3A2c – sheep and 3A2d – goat. For swine, the distribution is from the EPA report Table A-172 and the CH_4 conversion factors by waste management systems are from CARB's 2000–2019 GHG inventory, 3A2d – swine. The CH_4 conversion factors are not available, and the default values from Table A.2.1.2 and Table A.2.1.3 in the ICLEI Community Inventory Appendix G were used.

Table 27 Methane Emissions from Manure Management – Cattle (San Diego Region, 2019)

Waste Management System	Dairy Cow		Other Cattle		Beef Cow	
	Distribution of Manure	CH_4 Conversion Factor	Distribution of Manure	CH_4 Conversion Factor	Distribution of Manure	CH_4 Conversion Factor
Dry Lot	3%	1.5%	99%	1.5%	100%	1.5%
Pasture	5%	1.5%	2%	1.5%	0%	1.5%
Liquid Slurry	3%	33%	1%	33%	1%	45%
Daily Spread	0%	0.5%	0%	0%	0%	0%
Solid Storage	26%	4%	0%	0%	0%	0%
Anaerobic Lagoon	54%	74%	0%	74%	0%	0%
Deep Pit	9%	32%	0%	0%	0%	0%
Volatile Solids (VS) (kg/animal/yr.)	2,780		1,043		1,891	
Maximum CH_4 Producing Capacity per Pound of Manure (m^3/kg VS)	0.24		0.17		0.33	
Population	4,300		5,200		3,700	
GHG Emissions (MT CO_2e)	21,375		294		745	

Emissions are calculated based on ICLEI Community Inventory Appendix G, Equation A.2.1.1a, A.2.1.1b, and A.2.1.2.
Energy Policy Initiatives Center, University of San Diego 2022

Table 28 Methane Emissions from Manure Management – Other Animals (San Diego Region, 2019)

Waste Management System	Sheep		Goats		Swine	
	Distribution of Manure	CH_4 Conversion Factor	Distribution of Manure	CH_4 Conversion Factor	Distribution of Manure	CH_4 Conversion Factor
Dry Lot	31%	1.5%	8%	1.5%	0%	1%
Pasture	69%	1.5%	92%	1.5%	15%	0%
Liquid Slurry	0%	0%	0%	0%	28%	31%
Daily Spread	0%	0%	0%	0%	0%	0%
Solid Storage	0%	0%	0%	0%	0%	2%
Anaerobic Lagoon	0%	0%	0%	0%	29%	73%
Deep Pit	0%	0%	0%	0%	27%	31%
Maximum CH_4 Producing Capacity per Pound of Manure (m^3/kg VS)	0.36		0.17		0.48	
Average Volatile Solids (kg/day/1,000 kg animal mass)	8.3		9.5		5.4	
Typical Animal Mass (TAM, kg)	53		64		45	
Population	960		1,391		1,558	
GHG Emissions (MT CO_2e)	14		13		416	

Emissions are calculated based on ICLEI Community Inventory Appendix G, Equation A.2.1.1a, A.2.1.1b, and A.2.1.2.
Energy Policy Initiatives Center, University of San Diego 2022

4.6.5.2 Direct N_2O Emissions from Manure Management

Under method A.2.3, direct N_2O emissions from manure management, the N_2O emissions that are released directly from manure depend on the animal population, animal characteristics, and the type of manure management system. The types and distribution of manure management system for each animal type are shown in Table 27 and Table 28. Similar to the CH_4 emissions calculation, the Kjeldahl nitrogen (organic nitrogen in the form of either ammonia or ammonium) excreted by cattle is based on the number of cattle; for other animals, it is based on animal weight. Direct N_2O emissions from each management system for each animal population is calculated separately, by multiplying the daily rate of Kjeldahl nitrogen excreted with the N_2O conversion factor for each management system. The direct N_2O emissions from cattle are shown in Table 29;[67] and the direct N_2O emissions from other animals are shown in Table 30.[68]

Table 29 Direct N_2O Emissions from Manure Management – Cattle (San Diego Region, 2019)

Waste Management System	Dairy Cow		Other Cattle		Beef Cow	
	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)
Dry Lot	3%	0.02	99%	0.02	100%	0.02
Pasture	5%	0	2%	0	0%	0
Liquid Slurry	3%	0.005	1%	0.005	1%	0.005
Daily Spread	0%	0	0%	0	0%	0
Solid Storage	26%	0.005	0%	0.005	0%	0.005
Anaerobic Lagoon	54%	0	0%	0	0%	0
Deep Pit	9%	0.002	0%	0.002	0%	0.002
The daily rate of Kjeldahl nitrogen excreted (kg N/animal/year)	155		56		59	
Population	4,300		5,200		3,700	
GHG Emissions ($MT CO_2e$)	696		2,701		2,050	
Emissions are calculated based on the ICLEI Community Inventory Appendix G, Equation A.2.3.1a, A.2.3.1b, and A.2.3.2. Energy Policy Initiatives Center, University of San Diego 2022						

[67] ICLEI Community Inventory Appendix G, Equation A.2.3.1a, A.2.3.1b, and A.2.3.2. Direct N_2O emission factors are from CARB's 2000–2019 GHG inventory, 3A2d – dairy cows.
[68] ICLEI Community Inventory Appendix G, Equation A.2.1.1a, A.2.1.1b, and A.2.1.2. For sheep and goats, distributions of manure and CH_4 conversion factor by waste management system and CH_4 are from CARB's 2000–2019 GHG inventory, 3A2c – sheep and 3A2d – goat. For swine, the distribution is from the EPA report Table A-172 and the N_2O emission factors are from CARB's 2000–2019 GHG inventory, 3A2d – swine.

Table 30 Direct N_2O Emissions from Manure Management – Other Animals (San Diego Region, 2019)

Waste Management System	Sheep		Goats		Swine	
	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)	Distribution of Manure	Direct N_2O Emission Factor (kg N_2O-N/kg N excreted)
Dry Lot	31%	0.02	8%	0.02	0%	0.01
Pasture	69%	0	92%	0	15%	0
Liquid Slurry	0%	0	0%	0	28%	0.005
Daily Spread	0%	0	0%	0	0%	0
Solid Storage	0%	0	0%	0	0%	0.005
Anaerobic Lagoon	0%	0	0%	0	29%	0
Deep Pit	0%	0	0%	0	27%	0.002
The daily rate of Kjeldahl nitrogen excreted (kg/day/1,000 kg animal mass)	0.45		0.45		0.54	
Typical Animal Mass (TAM, kg)	53		64		45	
Population	960		1,391		1,558	
GHG Emissions (MT CO_2e)	24		11		12	
Emissions are calculated based on the ICLEI Community Inventory Appendix G, Equation A.2.3.1a, A.2.3.1b, and A.2.3.2. Energy Policy Initiatives Center, University of San Diego 2022						

4.6.5.3 Indirect N_2O Emissions from Manure Management

In addition, Method A.2.4 estimates the indirect N_2O emissions associated with the nitrification-denitrification process of nitrogen remaining in the soil and from nitrogen lost through runoff and leaching. The indirect N_2O emissions from each management system for each animal population is calculated separately, by multiplying the nitrogen excreted, N_2O conversion factor, the nitrogen loss through runoff and leaching rates for each management system. The indirect N_2O emissions from cattle are shown in Table 31;[69] the indirect N_2O emissions from other animals are shown in Table 32.[70]

[69] ICLEI Community Inventory Appendix G, Equation A.2.4.2. The nitrogen loss through volatilization, runoff and leaching percentages are from the CARB 2000–2018 GHG inventory, 3A2d – dairy cows.
[70] ICLEI Community Inventory Appendix G, Equation A.2.4.2. The nitrogen loss through volatilization, runoff and leaching percentages are from the CARB 2000–2018 GHG inventory, 3A2c – sheep, 3A2d – goat, and 3A2d – swine.

Table 31 Indirect N_2O Emissions from Manure Management – Cattle (San Diego Region, 2019)

Waste Management System	Dairy Cow			Other Cattle			Beef Cow		
	Manure Distribution	Nitrogen Loss - volatilization (%)	Nitrogen Loss - runoff and leaching (%)	Manure Distribution	Nitrogen Loss - volatilization (%)	Nitrogen Loss - runoff and leaching (%)	Manure Distribution	Nitrogen Loss -volatilization (%)	Nitrogen Loss - runoff and leaching (%)
Dry Lot	3%	15%	2%	99%	23%	3.9%	100%	23%	3.9%
Pasture	5%	0%	0%	2%	0%	0%	0%	0%	0%
Liquid Slurry	3%	26%	0.8%	1%	26%	0%	1%	26%	0%
Daily Spread	0%	10%	0%	0%	0%	0%	0%	0%	0%
Solid Storage	26%	27%	0%	0%	0%	0%	0%	0%	0%
Anaerobic Lagoon	54%	43%	0.8%	0%	0%	0%	0%	0%	0%
Deep Pit	9%	24%	0%	0%	0%	0%	0%	0%	0%
Emission Factors (kg N2O-N/ kg N)	-	0.01	0.0075	-	0.01	0.0075	-	0.01	0.0075
N_excreted (kg N/year)	666,500			291,200			218,300		
GHG Emissions (MT CO_2e)	1,062			353			268		
Emissions are calculated based on the ICLEI Community Inventory Appendix G, Equation A.2.4.2 Energy Policy Initiatives Center, University of San Diego 2022									

Table 32 Indirect N_2O Emissions from Manure Management – Other Animals (San Diego Region, 2019)

Waste Management System	Sheep			Goats			Swine		
	Manure Distribution	Nitrogen Loss - volatilization (%)	Nitrogen Loss - runoff and leaching (%)	Manure Distribution	Nitrogen Loss - volatilization (%)	Nitrogen Loss - runoff and leaching (%)	Manure Distribution	Nitrogen Loss - volatilization (%)	Nitrogen Loss - runoff and leaching (%)
Dry Lot	31%	23%	3.9%	8%	23%	0%	0%	0%	0%
Pasture	69%	0%	0%	92%	0%	0%	15%	0%	0%
Liquid Slurry	0%	0%	0%	0%	0%	0%	28%	26%	0.8%
Daily Spread	0%	0%	0%	0%	0%	0%	0%	0%	0%
Solid Storage	0%	0%	0%	0%	0%	0%	0%	45%	0%
Anaerobic Lagoon	0%	0%	0%	0%	0%	0%	29%	58%	0.8%
Deep Pit	0%	0%	0%	0%	0%	0%	27%	34%	0.0%
Emission Factors (kg N2O-N/ kg N)	-	0.01	0.0075	-	0.01	0.0075	-	0.01	0.0075
N_excreted (kg N/year)	8,278			14,624			13,716		
GHG Emissions (MT CO_2e)	3			1			22		
Emissions are calculated based on the ICLEI Community Inventory Appendix G, Equation A.2.4.2 Energy Policy Initiatives Center, University of San Diego 2022									

4.6.6 Soil Management

Application of synthetic fertilizer on agriculture land and nitrogen content in crop residue produces N_2O emissions in two ways: (1) direct N_2O emissions from the soils, and (2) indirect N_2O emissions from volatilization and leaching/runoff from land. In addition, urea fertilizer and liming applied to soil to reduce soil acidity and improve plant growth, produce CO_2 emissions.

The total emissions from soil management, combining N_2O and indirect N_2O emissions from fertilizer and crop residue, and CO_2 emissions from lime and urea, are provided in Table 33. The detailed methods used are described in Section 4.6.5.1 through Section 4.6.5.3. The San Diego regional soil management emissions were then scaled to the unincorporated county based on the ratio of agricultural land acreage in the unincorporate county to the region.

Table 33 GHG Emissions from Soil Management (Unincorporated County of San Diego, 2019)

Emissions From Soil Management	Synthetic Fertilizer Nitrogen Applied to Soils	Nitrogen in Crop Residue
Direct N_2O Emissions from Nitrogen (MT CO_2e)	10,014	173
Indirect N_2O Emissions from Nitrogen (MT CO_2e)	3,255	39
Total N_2O Emissions from N inputs (MT CO_2e)		13,480
Total CO_2 Emissions from Liming and Urea (MT CO_2e)		440
GHG Emissions from Soil Management (MT CO_2e)		13,920
Ratio of Agriculture Land Acreage – Unincorporated County to San Diego Region		88%
Unincorporated County of San Diego - Soil Management (MT CO_2e)		12,244
Agricultural land acreages in the unincorporated county do not include the rural residential areas that may have small orchards or fields on the land. Energy Policy Initiatives Center, University of San Diego 2022		

4.6.6.1 Direct and Indirect N_2O Emissions from Synthetic Fertilizer

The method to estimate direct and indirect N_2O emissions is based on the Tier 1 approach of direct N_2O emissions in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.[71] The method uses default emission factors to (1) convert nitrogen applied to agricultural soils to N_2O emitted, (2)convert nitrogen volatized and re-deposited on soils to N_2O emitted, and (3)convert the proportion of nitrogen lost to leaching and runoff to N_2O emitted. Since 2017, instead of the IPCC Tier 1 approach, CARB has used a process-based denitrification-decomposition (DNDC) model to estimate direct and indirect N_2O emissions in the statewide GHG inventory, which accounts for both natural factors and farming practices that affect N_2O emissions from soil.[72] Because the DNDC model is not available at the local level, the IPCC Tier 1 approach is used here.

[71] IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Chapter 11, Section 11.2.1 Direct N_2O emissions and Section 11.2.2 Indirect N_2O Emissions, accessed July 21, 2021.
[72] CARB: Inventory Updates since the 2016 Edition of the Inventory (2017). CARB updated calculation in 2017, before 2017, the method is the same as the IPCC Tier 1 approach.

The California Department of Food & Agriculture (CDFA) releases the Fertilizing Materials Tonnage Report semi-annually, which summarizes California and county-level (regional-level) tonnage sales and distribution of commercial fertilizers and agricultural minerals. The 2019 tonnage of each synthetic fertilizer was multiplied by its nitrogen content based on the specific chemical content to estimate the total nitrogen applied to the soil.[73] If the specific chemical content of a fertilizer was not given, code 97 fertilizer with a 25-15-17 Nitrogen-Phosphorous-Potassium (NPK) composition was used. The nitrogen applied to soil in 2019 is provided in Table 34.[74]

Table 34 Nitrogen Applied to Soil from Fertilizer (San Diego Region, 2019)

Fertilizer Type (with Nitrogen Content)	2019 Fertilizer Tonnages	Proportion of Nitrogen*	2019 Nitrogen Tonnages
Ammonium Nitrate	1,018	0.335	341
Ammonium Nitrate solution	187	0.200	37
Ammonium Sulphate	367	0.210	77
Calcium Ammonium Nitrate	484	0.270	131
Calcium Nitrate	2,994	0.155	464
Nitrogen Solution 28%	138	0.280	39
Nitrogen Solution 32%	273	0.320	87
Urea	494	0.460	227
Nitrogen materials – other**	3,815	0.250	954
		Total	2,357

Farm use fertilizer only
*Proportion of nitrogen is based on the fertilizer's Nitrogen-Phosphorous-Potassium composition
**The fertilizer code is 97 (25-15-17 Nitrogen-Phosphorous-Potassium)
CDFA, Energy Policy Initiatives Center, University of San Diego 2022

The total nitrogen applied in Table 33 is then converted to direct and indirect N_2O emissions, based on the default emission factors to convert nitrogen applied to agricultural soils to N_2O emitted, nitrogen volatized and re-deposited on soils to N_2O emitted, and the proportion of nitrogen lost to leaching and runoff to N_2O emitted. The direct and indirect N_2O emissions, in CO2e, are shown in Table 35.

Table 35 Direct and Indirect N_2O Emissions from Synthetic Fertilizer (San Diego Region, 2019)

Key Inputs for Direct and Indirect N_2O Emissions Calculation	Factors and Results
Nitrogen in soils (tons per year)	2,357
Direct N_2O emissions	
Emitting Rate (N_2O -N emitted/N applied)	0.01
Direct N_2O emissions from nitrogen applied to managed soil (MTCO_2e)	10,014
Indirect N_2O emissions	
Volatilization rate (N volatilized/N applied)	0.1
Redeposited nitrogen emitted as N_2O	0.01
Leaching rate (N lost by leaching and runoff/N applied)	0.3
Leached nitrogen emitted as N_2O	0.0075
Indirect N_2O emissions from nitrogen applied to managed soil (MT CO_2e)	3,255
Total Direct and indirect N_2O emissions from nitrogen applied to managed soil (MTCO_2e)	13,269

Unit conversions and molecular weight ratio of N_2O to N_2 conversions are not shown in the table.
Energy Policy Initiatives Center, University of San Diego 2022

[73] CDFA: Fertilizing Materials Tonnage Report, accessed June 22, 2021.
[74] Portion of nitrogen is based on the fertilizer's Nitrogen-Phosphorous-Potassium composition using International Fertilizer Association's Fertilizer Converter.

4.6.6.2 Direct and Indirect N_2O Emissions from Crop Residue

Farms have N_2O emissions from crop residue and from crop burning activities. For crops, the nitrogen contents in above-ground and below-ground residue are different. The nitrogen content is calculated based on the ratio of above-ground/below-ground dry matter to harvested dry matter, and ratio of residue to above-ground/below-ground dry matter. Because the San Diego region does not have crops accounting for the majority of biomass burning (barley, corn, rice, wheat, almond, and walnut), this section only includes the emissions due to crop residue. Among the crops that have nitrogen content in their residue, only hay & oats are grown in the San Diego region.[75] The total nitrogen content in hay & oats residue is shown in Table 36.[76]

Table 36 Nitrogen in Crop Residue (San Diego Region, 2019)

Key Inputs to Estimate Nitrogen Content in Crop Residue	Factors and Results
Oats harvested area	758 ha (1,874 acres)
Oats harvested yield (tons/acre)	2
Dry matter fraction of harvested oats	0.89
Annual harvested dry matter (kg/ha)	3,990
Above-ground residue dry matter (Mg/ha)	4.52
Ratio of above-ground residue dry matter to harvested dry matter	1.133
N content of above ground residue	0.007
Ratio of below-ground residue to above-ground biomass	0.25
Ratio of below-ground residue dry matter to harvested dry matter	0.533
N content of below-ground residue	0.008
N in crop residue (tons)	41
Factors based on 2006 IPCC Guidelines for GHG Inventory, Ch. 11, Sec. 11.2.1–11.2, Equation 11.6, Equation 11.7, Table 11.2. County of San Diego, Energy Policy Initiatives Center, University of San Diego 2022	

The total nitrogen in crop residue, Table 33, is then converted to direct and indirect N_2O emissions. The method is the same as the method discussed in Section 4.6.5.1, but there is no nitrogen volatilization in crop residue. The direct and indirect N_2O emissions are shown in Table 37.

Table 37 Direct and Indirect N_2O Emissions from Crop Residue (San Diego Region, 2019)

Key Inputs for Direct and Indirect N_2O Emissions Calculation	Factors and Results
Nitrogen in soils (tons per year)	41
Direct N_2O emissions	
Emitting rate (N_2O -N emitted/N applied)	0.01
Direct N_2O emissions from nitrogen in crop residue (MT CO_2e)	173
Indirect N_2O emissions	
Leaching rate (N lost by leaching and runoff /N applied)	0.3

[75] County of San Diego Department of Agriculture, Weights and Measures. 2019 Crop Statistics and Annual Report, accessed May 10, 2021.
[76] IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Chapter 11, Section 11.2.1 Direct N_2O emissions and Section 11.2.2 Indirect N_2O Emissions, factors are based on Equation 11,6, Equation 11.7, and Table 11.2 accessed July 21, 2021.

Key Inputs for Direct and Indirect N_2O Emissions Calculation	Factors and Results
Leached nitrogen emitted as N_2O	0.0075
Indirect N_2O emissions from nitrogen in crop residue (MT CO_2e)	39
Total Direct and indirect N_2O emissions from nitrogen in crop residue (MT CO_2e)	212
Unit conversions and molecular weight ratio of N_2O to N_2 conversions are not show in the table. Energy Policy Initiatives Center, University of San Diego 2022	

4.6.6.3 CO_2 Emissions from Lime and Urea Application

Liming is used to reduce soil acidity and improve plant growth in agriculture land. Adding carbonates to soils in the form of lime leads to CO_2 emissions as the carbonated limes dissolve and release bicarbonate, which evolves into CO_2 and water. Similarly, adding urea ($CO(NH_2)_2$) to soils during fertilization releases bicarbonate and later evolves into CO_2 and water.

The CO_2 emissions from urea application and from liming are based on the total quantities of urea and lime applied and their respective emission factors. CO_2 emissions from liming material is calculated by multiplying the tonnage of liming material, emission factor of C to liming material, and the CO_2 to C conversion factor. Similarly, CO_2 emissions from urea is calculated by multiplying the tonnage of urea, emission factor of C to urea, and the CO_2 to C conversion factor. The CO_2 emissions are shown in Table 38.[77]

Table 38 CO_2 Emissions from Lime and Urea Application (San Diego Region, 2019)

Key Inputs for CO_2 Emissions from Lime and Urea Calculation	Factors and Results
Liming Material (tons)	267
Emission Factor (tons of C/tons of liming material) *	0.125
CO2 Emissions from Liming Material (MT CO_2e) *(a)*	111
Urea ($CO(NH_2)_2$,tons)	494
Emission factor (tons of C/tons of urea)	0.2
CO2 Emissions from Urea (MT CO_2e) *(b)*	329
CO2 Emissions from Liming and Urea (MT CO_2e) *(a + b)*	440
*Average of limestone and dolomite Factors are based on 2006 IPCC Guidelines for GHG Inventory, Chapter 11, Section 11.3–11.4, and Equation 11.12, Equation 11.13 CDFA, Energy Policy Initiatives Center, University of San Diego 2022	

[77] CDFA: Fertilizing Materials Tonnage Report, accessed June 22, 2021. Emission factors are from IPCC: 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Chapter 11, Section 11.3.CO2 Emissions from Liming and Section 11.4 CO2 Emissions from Urea Fertilization, emission factors are based on Equation 11.2 and Equation 11.3, accessed July 21, 2021.

4.7 Off-Road Transportation

4.7.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from purchased diesel for emergency generators at County buildings and other facilities and purchased diesel for County airports, total off-road transportation emissions in 2019 are 71,000 MT CO_2e, with purchased diesel for County operations resulting in 100 MT CO_2e or less than 1% of all off-road transportation emissions. It is assumed that the majority of emissions from landscape equipment used in County facilities and construction emissions from Capital Improvement Projects are fully within the unincorporated county. Emissions from consumption of diesel used in generators at Airports and Government Building located outside of unincorporated county are added to emissions from off-road vehicles and equipment for estimating combined emissions. Emissions from consumption of diesel used at Airports and Government Building located inside unincorporated county are not added because these emissions are included in emissions from off-road vehicles and equipment in the county.

4.7.2 Methods

Emissions from off-road vehicles and equipment, both diesel and gasoline-fueled, are from the fuel combustion in internal combustion engines.

CARB released OFFROAD2021, an online emissions inventory database for off-road equipment and vehicles, in 2021, that generates off-road vehicles emissions by county (region), vehicle category, equipment type, horsepower (HP), and fuel type.[78] The previous comprehensive CARB off-road equipment and vehicle model was OFFROAD2007, released in 2007. After the release of OFFROAD2007, CARB developed category specific methods and inventory models for specific regulatory support, which replaced the results of specific vehicle categories in OFFROAD2007.OFFROAD2021 integrates data from several updated off-road models, such as SORE 2020, which generates emissions for off-road vehicles with engines less than or equal to 25 HP, RV 2018, which generates emissions for recreational vehicles, and other sector specific models.
Specific data on off-road vehicles for the county are not available, therefore, the emissions estimated in each vehicle category for the San Diego region were allocated to the county based on category-specific economic and demographic data, as discussed in Section 2.4 (Demographics). The key inputs and GHG emissions from off-road transportation in 2019 are show in Table 39.[79]

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[78] CARB: Updates to CARB's Online Emissions Inventory Database for Off-Road Equipment and Vehicles. October 19, 2021.

[79] OFFROAD2021 v1.0.3 data were downloaded from CARB EMFAC database (Offroad Emissions) on August 23, 2022. Emissions in San Diego County (San Diego region) in CARB models were given in tons per day and converted to metric tons per year.

Table 39 Key Inputs and GHG Emissions from Off-Road Transportation (Unincorporated County of San Diego, 2019)

Vehicle Category	Emissions in San Diego Region (MT CO_2e)	Allocation Factor	Unincorporated County to San Diego Region Ratio	Emissions in Unincorporated County (MT CO_2e)
Lawn and Garden Equipment	50,353	Population	14%	7,233
Light Commercial Equipment	69,889	Commercial Jobs	9%	5,999
Transport Refrigeration Units	33,242	Commercial Jobs	9%	2,854
Airport Ground Support	16,120	Population	14%	2,316
Construction and Mining	177,469	Construction Jobs	25%	44,179
Industrial	89,626	Manufacturing Jobs	9%	7,829
Recreational Vehicles	2,855	Population	14%	410
			Total	**71,000**

Notes:
The unincorporated county to San Diego region ratios were based on 2019 population and jobs estimates discussed in Section 2.4, SANDAG 2019 regional Demographic and Socioeconomic Estimates (July 23, 2021 version), and 2019 regional projection in Series 14 Growth Forecast (interpolated between 2018 estimates and 2020 forecast), downloaded from SANDAG Data Surfer, January 22, 2023. Section 2.4 provides the total jobs estimates in the unincorporated county, while jobs estimates by type are used here. The unincorporated county to San Diego region ratios are: (1) population (479,844 to 3,340,302); (2) commercial jobs (119,592 to 1,393,149); (3) construction jobs (21,645 to 86,552); and (4) manufacturing jobs (9,858 to 112,861).
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation.
CARB OFFROAD2021 v1.0.3, Energy Policy Initiatives Center, University of San Diego 2023

4.8 Water

4.8.1 Combined Emissions – Community-wide and County Operations

When accounting for the addition of GHG emissions from water use at County buildings and other facilities located outside of the unincorporated county, total off-road transportation emissions in 2019 are 39,000 MT CO_2e, with water use at County buildings and other facilities located outside of the unincorporated county resulting in negligible GHG emissions. Emissions from water used at County facilities located outside of the unincorporated county are added to emissions from water use in the community for estimating combined emissions, while emissions from water used at County facilities located inside the unincorporated county are included in the community water use related emissions.

4.8.2 Methods

Emissions from water supplied to county's residents and business are from energy used to supply and convey, treat, and distribute water. The emissions depend on the sources of water, distance of water conveyance, and the treatment processes before the end-use phase. Emissions from water were estimated based on Method WW.14 from the U.S. Community Protocol.[80] Method WW.14 accounts for each segment of the water cycle (upstream supply and conveyance, treatment, and local distribution) individually. Emissions in the water category are calculated based on the electricity use associated with each water cycle and the emission factor of the electricity used in each water cycle.

[80] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix F. Wastewater and Water Emission Activities and Sources.

Member agencies of the San Diego County Water Authority (SDCWA or the Water Authority), community water districts, or private water companies provide water services to the county. The water supply and associated energy use from each supplier are discussed in Section 4.8.1 and Section 4.8.2; and the emissions from energy used for water are discussed in Section 4.8.3. Energy use and associated emissions from the water end-use phase are not included in this category, as they are captured in the electricity, natural gas, or propane category.

4.8.3 Water Supply from SDCWA Member Agencies and Associated Energy Use

SDCWA has 24 member agencies that provide water in the San Diego region. Each member agency either purchases all water directly from the Water Authority or purchases a portion of the water from Water Authority with the rest from local supply sources, such as surface water or recycled water. These member agencies have all or part of their service area within the county. The water sources (Water Authority supply, and local supply if any) each member agency provides to the county are assumed to be the same as the water sources of the member agency's entire service area. Member agencies, service area population in the county, and the source of water supplied are provided in Table 40.[81]

Table 40 Water Supplied by San Diego County Water Authority Member Agencies (Unincorporated County of San Diego, 2019)

Water Authority Member Agencies	Service Area Population in the Unincorporated County*	Water Authority Supply** (Acre-feet)	Local Supply	
			Source of Local Supply	Local Supply** (Acre-feet)
Fallbrook Public Utility District	32,997	7,829	Surface, Recycled	746
Helix Water District	80,067	6,719	Surface	1,624
Lakeside Water District	32,058	2,761	Surface	638
Olivenhain Municipal Water District	26,907	8,339	Surface, Recycled	1,178
Otay Water District	71,783	9,105	Recycled	603
Padre Dam Municipal Water District	36,961	3,612	Surface, Recycled	279
Rainbow Municipal Water District	21,063	14,559	-	-
Ramona Municipal Water District	33,468	4,183	Surface, Recycled	395
Rincon Del Diablo Municipal Water District	13,539	346	Recycled	311
San Dieguito Water District	3	0.3	Surface	0.3
Santa Fe Irrigation District	6,852	2,046	Surface	1,177
South Bay Irrigation District	15,259	310	Ground, Surface	1,023
Vallecitos Water District	9,099	964	Desalination	300
Valley Center Municipal Water District	25,426	16,564	Surface	393
Vista Irrigation District	18,206	865	Surface	1,346
Yuima Municipal Water District	1,823	4,700	Groundwater, Surface	5,174
Total	**425,511**	**82,903**	**-**	**15,187**

*2018 population within each member agency's service area in the unincorporated county is based on GIS analysis
**Assumes that the ratio of Water Authority supply and local supply for the service area in the unincorporated county is the same as in the entire service area. Water supply is the average of fiscal year 2019 and 2020 supply
County of San Diego 2021, Energy Policy Initiatives Center, University of San Diego 2021

[81] Water supply and sources are from SDCWA Fiscal Year 2019 Annual Report and Fiscal Year 2020 Annual Report, accessed on January 11, 2021 and April 23, 2021, respectively. The county population covered by water and wastewater districts were provided by County based on GIS analysis (May 19, 2021). 2019 population data were not available, 2018 population data were used.

The energy needed to convey, treat, and distribute the Water Authority supply and local supply are different. The Water Authority supply comes from two sources: (1) the State Water Project, and (2) the Colorado River, through the Metropolitan Water District of Southern California (MWD). The upstream energy intensity of the Water Authority supply is provided in Table 41. [82]

Table 41 Upstream Energy Intensity of San Diego County Water Authority Supply

Water System Segment	2019 Energy Intensity (kWh per acre-foot)	Data Source
MWD Delivered Untreated* *(a)*	1,920	MWD 2020 UWMP 2020 Appendix 10
SDCWA conveyance** *(b)*	-32.6	SDCWA UWMP 2020 Draft Appendix I
SDCWA Untreated Subtotal (a+b)	*1,887*	-
SDCWA treatment*** *(c)*	112	SDCWA UWMP 2020 Draft Appendix I
SDCWA distribution**** *(d)*	7.7	SDCWA UWMP 2020 Draft Appendix I
SDCWA Treated Total (a+b+c+d)	2,005	-
Upstream Energy Intensity	**1,946**	Average of Treated (2,005) and Untreated (1,887)

* 2018 data
** Negative energy intensity indicates the process is primarily gravity flow with little to no energy use and produces electricity from water flowing through the pipeline
*** Energy use at SDCWA's Twin Oaks Valley Water Treatment Plant
**** Energy use at Valley Center Pump Station and other small facilities for treated water distribution
MWD = Metropolitan Water District of Southern California, SDCWA = San Diego County Water Authority, UWMP = Urban Water Management Plan
MWD 2021, SDCWA 2021, Energy Policy Initiatives Center, University of San Diego 2021

The energy associated with the local distribution of Water Authority supply is based on the water distribution energy intensity of each member agency. The upstream and local energy use of Water Authority supply is shown in Table 42.[83]

Table 42 Upstream and Local Energy Use of San Diego County Water Authority Supply (Unincorporated County of San Diego, 2019)

Water Authority Supply (Acre-feet)* *(a)*	82,903
Upstream Energy (kWh/Acre-foot)** *(b)*	1,946
Upstream Electricity Use (kWh) *(a * b)*	161,339,756
Local Distribution Energy Intensity (kWh/Acre-foot)*** *(c)*	139
Local Distribution Electricity use (kWh) *(a*c)*	11,541,164

*Calculated in Table 39
**Calculated in Table 40
***Weighted average of the local distribution energy intensity of member agencies providing water to the unincorporated county
Energy Policy Initiatives Center, University of San Diego 2021

[82] MWD: 2020 Urban Water Management Plan, June 2021, accessed on March 24, 2023. SDCWA: 2020 Urban Water Management Plan, May 2021, accessed on March 24, 2023. SDCWA also receives water from the Carlsbad Desalination Plant, however, the portion of water from the Plant of total Water Authority Supply is not available.
[83] The local distribution energy intensity of each member agency was collected from either the 2020 Urban Water Management Plan draft or from personal communication between EPIC and the member agency. If the distribution energy intensity is not available, the data from a nearby member agency is used. The weighted average is shown in the table.

For local water supply, the energy use depends on the water source, the member agency's water treatment process and distribution system. The treatment and distribution energy use of local supply is shown in Table 43.[84]

Table 43 Treatment and Distribution Energy Use of Local Water Supply (Unincorporated County of San Diego, 2019)

Local Water Supply (Acre-feet)* *(a)*	15,187
Local Water Treatment Energy Intensity (kWh/Acre-foot)** *(b)*	233
Local Water Treatment Electricity Use (kWh) *(a*b)*	3,544,632
Local Distribution Energy Intensity (kWh/Acre-foot)** *(c)*	102
Local Distribution Electricity use (kWh) *(a*c)*	1,553,885

*Calculated in Table 39
**Weighted average of local treatment and distribution energy intensity of agencies providing water to unincorporated county
Energy Policy Initiatives Center, University of San Diego 2021

4.8.4 Water Supply outside SDCWA Service Area and Associated Energy Use

For the population outside the SDCWA service area, it is assumed that water supply is local groundwater derived from on-site private wells, small community water systems, or private water companies. Among the water supply providers listed in Table 43, only the Campo Water Maintenance District is owned and operated by the County. The water districts, service area population in the county, and the water supplied are provided in Table 44.[85]

Table 44 Water Supply Outside San Diego County Water Authority Service Area (Unincorporated County of San Diego, 2019)

Water Districts	Service Area Population in the Unincorporated County*	Water Supplied** (Acre-feet/year)
Campo Water Maintenance District	790	105
Borrego Water District	3,720	494
Canbrake County Water District	126	17
Cuyamaca Water District	133	18
Descanso Community Services District	757	100
Jacumba Community Services District	505	67
Julian Community Services District	268	36
Majestic Pines Community Services District	1,240	165
Mootamai Municipal Water District	390	52
Pauma Municipal Water District	201	27
Questhaven Municipal Water District	2	0.3
San Luis Rey Municipal Water District	139	18
Wynola Water District	126	17
Total with Specified Water Districts	7,607	1,009

[84] Local treatment and distribution energy intensity of each member agency was collected from either 2020 Urban Water Management Plan draft or from personal communication between EPIC and the member agency. If the energy intensity is no available, the data from a nearby member agency or a member agency with similar system is used. The weighted averages are shown in the table.
[85] The population served and water flow at Campo Water Maintenance District were provided by County, January 28, 2021. County population covered by water and wastewater districts were provided by County based on GIS analysis (May 19, 2021). 2019 population data were not available, 2018 population data were used.

Water Districts	Service Area Population in the Unincorporated County*	Water Supplied** (Acre-feet/year)
Unspecified Water Supply	46,726	6,199
	Total	**7,208**

*2018 population within each member agency's service area in unincorporated county is based on GIS analysis
**For Campo Water Maintenance District, the service area population and water supplied were provided by the County directly. For other districts, the water supplied was calculated based on the service area population and Campo Water Maintenance District's per capita water use in 2019 (118 gallon per capita per day)
County of San Diego 2021, Energy Policy Initiatives Center, University of San Diego 2023

Because the groundwater pumping and treatment energy use at each water district is not available, the estimated energy intensity at Sweetwater Authority's National City Wells, a groundwater facility, is used to estimate the groundwater pumping and treatment energy use. The energy use of groundwater supply is shown in Table 45.[86]

Table 45 Energy Use of Groundwater Supply (Unincorporated County of San Diego, 2019)

Groundwater Supply (Acre-feet)*	7,208
Groundwater Pumping and Treatment Energy Intensity (kWh/Acre-foot)**	657
Groundwater Electricity Use (kWh)	4,735,586

*Calculated in Table 42
** 2018 groundwater pumping energy intensity at National City Wells
Energy Policy Initiatives Center, University of San Diego 2023

4.8.5 Emissions from Energy Used for Water

Emissions in the water category are calculated based on the electricity use associated with water supply, treatment, and distribution, as shown in Section 4.8.1 and Section 4.8.2, and the emission factor of the electricity use.

The California average electricity emission factor in eGRID2019, 455 lbs CO_2e/MWh, is applied to upstream electricity use; and the SDG&E bundled electricity emission factor for 2019, 633 lbs CO_2e/MWh, is applied to all local electricity use of the water districts within and outside SDCWA service area.[87] The key inputs and GHG emission from water in 2019 are shown in Table 46.

[86] The 2018 groundwater pumping energy intensity at National City Wells was provided by personal communications between EPIC and City of Chula Vista, March 4, 2019.
[87] U.S. EPA: eGRID 2019, released on February 23, 2021, downloaded on April 13, 2021. CAMX WECC emission factor. The SDG&E bundled emission factor is discussed in Section 4.2.

Table 46 Key Inputs and GHG Emissions from Water (Unincorporated County of San Diego, 2019)

Upstream Electricity Use (kWh)*	161,339,756
Upstream Electricity Emission Factor (lbs CO_2e/MWh)**	455
Upstream Emissions (MT CO_2e)	33,320
Local Electricity use (kWh)***	21,375,267
Local Electricity Emission Factor (lbs CO_2e/MWh)*****	633
Distribution Emissions (MT CO_2e)	6,134
Total Emissions (MT CO_2e)	39,000

*Calculated in Table 40
** CAMX WECC emission factor in eGRID2019
***Sum of local energy use in Table 40, Table 41, and Table 43
***SDG&E 2019 bundled electricity emission factor
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation.
Energy Policy Initiatives Center, University of San Diego 2023

4.9 Wastewater

4.9.1 Combined Emissions – Community-wide and County Operations

Emissions from wastewater generated in the county are from the wastewater treatment process, and from fugitive and stationary sources. The emissions depend on the wastewater treatment plant (WWTP) operations and treatment processes. Emissions from wastewater were estimated based on Method WW.14 of the U.S. Community Protocol.[88] Total wastewater emissions in 2019 are 18,000 MT CO_2e. The inventory for County operations emissions does not include any emissions from wastewater treatment processes as all wastewater treatment facilities owned and operated by the County have aerobic operations and do not generate CH_4. Electricity emissions associated with these facilities are captured under the electricity sector.

San Diego County Sanitation District (SDCSD), member agencies of SDCWA, and individual wastewater districts provide centralized wastewater services to the county. In addition, communities with dispersed populations use on-site wastewater treatment. The population served and wastewater flow from each source are discussed in the Sections 4.9.1 to Section 4.9.4 below; and the emissions from wastewater are discussed in Section 4.9.5.

4.9.2 Wastewater Flow Collected by San Diego County Sanitation District

SDCSD, part of the County's Department of Public Works, collects wastewater within the communities of Campo, Julian, and Pine Valley, and treats the wastewater at nearby SDCSD-operated WWTPs. In addition, SDCWA collects and conveys wastewater from communities of Alpine, East Otay Mesa, Lakeside, Spring Valley, and Winter Gardens, through City of San Diego's Metropolitan Wastewater System, to the City's Point Loma Wastewater Treatment Plant (Point Loma WWTP) for treatment and

[88] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix F. Wastewater and Water Emission Activities and Sources.

disposal.[89] The service area population and wastewater flow to each treatment facility are provided in Table 47.[90]

4.9.3 Wastewater Flow Collected by SDCWA Member Agencies

Some of the SDCWA member agencies provide wastewater services in the county in addition to water services, even though the water and wastewater service areas may be different. The 2019 wastewater generated in each member agency's service area in the unincorporated county is calculated based on (1) the wastewater flow in each agency's entire service area, and (2) the ratio of service area population in the unincorporated county to the entire service area population. For these member agencies, the service area population and wastewater flow collected by each agency and the treatment facilities are provided in Table 48.[91]

Table 47 Wastewater Flow Collected by San Diego County Sanitation District (Unincorporated County of San Diego, 2019)

Wastewater Treatment Facilities	Service Area Population in the Unincorporated County*	Wastewater Flow** (Million gallons/year)
Rancho del Campo WWTP	945	19
Julian WWTP	315	11
Pine Valley WWTP	183	3.6
San Pasqual Academy WWTP	325	1.4
Heise Park WWTP	200	1.0
City of San Diego Point Loma WWTP	115,464	3,198
Total	**117,432**	**3,234**

WWTP – wastewater treatment plant
*Point Loma WWTP service area population in the unincorporated county is calculated based on the difference between San Diego County Sanitation District's 2018 population (2019 population data are not available) and the 2019 population served by the remaining WWTPs.
**The wastewater conveyed to Point Loma WWTP in 2019 was significantly higher than in previous years due to commercial development close to the border area.
County of San Diego 2021, Energy Policy Initiatives Center, University of San Diego 2021

[89] County of San Diego: San Diego County Sanitation District System Description.
[90] 2019 wastewater flow collected in SDCSD and its treatment facilities data were provided by County (January 28, 2021 and February 19, 2021). County population covered by water and wastewater districts were provided by County based on GIS analysis (May 19, 2021). 2019 population data were not available, 2018 population data were used as proxy.
[92] 2019 wastewater treatment facilities' annual influent and effluent flows were provided to EPIC by the San Diego Regional Water Quality Control Board (March 3, 2021). County population covered by water and wastewater districts were provided by County based on GIS analysis (May 19, 2021). 2019 population data were not available, 2018 population data were used as proxy.

Table 48 Wastewater Flow Collected by San Diego County Water Authority Member Agencies (Unincorporated County of San Diego, 2019)

SDCWA Member Agency	Wastewater Treatment Facilities	Service Area Population in the Unincorporated County**	Wastewater Flow*** (Million gallons/year)
Fallbrook Public Utility District	Fallbrook Plant #1 WRF	25,242	557
Helix Water District*	Point Loma WWTP	48,954	767
Olivenhain Municipal Water District	4S Ranch WRF	17,945	288
Otay Water District	Ralph W. Chapman WRF	12,806	254
Padre Dam Municipal Water District*	Padre Dam WRF	8,644	135
Rainbow Municipal Water District*	San Luis Rey WWTP	21,043	330
Ramona Municipal Water District	Santa Maria WRF San Vicente WRF	19,647	413
Vallecitos Water District	Meadowlark WRF	7,414	75
Valley Center Municipal Water District	Wood Valley Ranch WRF Lower Moosa Canyon WRF	25,408	129
	Total	**187,103**	**2,947**

WWTP – wastewater treatment plant, WRF – water reclamation facility or water recycling facility
*Flow treated at the facilities for these districts are not available or cannot be separated out. The average wastewater generated per capita (43 gallons per capita per day) and the service area population in unincorporated county of each district with data available is used to estimate the wastewater flow
**2018 population within each member agency's service area in unincorporated county is based on GIS analysis, wastewater service area of each agency may differ from water service area
***Assumes the per capita wastewater generated by each agency in the Unincorporated County is the same as the rest of the agency's service area
Energy Policy Initiatives Center, University of San Diego 2021

4.9.4 Wastewater Flow Collected by Individual Districts

Other individual wastewater agencies, including Community Service Districts and Sanitation Districts, collect wastewater flows from communities in the county. For these districts, the service area population and wastewater flow collected by each district and the treatment facilities are provided in Table 49.[92]

Table 49 Wastewater Flow Collected by Individual Agencies (Unincorporated County of San Diego, 2019)

Wastewater Districts	Wastewater Treatment Facilities	Service Area Population in the Unincorporated County**	Wastewater Flow*** (Million gallons/year)
Borrego Water District*	Rams Hill WWTF	3,720	102
Buena Sanitation District*	Encina WPCF	10,612	290

[92] 2019 wastewater treatment facilities' annual influent and effluent flows were provided to EPIC by the San Diego Regional Water Quality Control Board (March 3, 2021). County population covered by water and wastewater districts were provided by County based on GIS analysis (May 19, 2021). 2019 population data were not available, 2018 population data were used as proxy.

Wastewater Districts	Wastewater Treatment Facilities	Service Area Population in the Unincorporated County**	Wastewater Flow*** (Million gallons/year)
Fairbanks Ranch Community Services District	Fairbanks Ranch WPCF	1,500	47
Pauma Valley Community Services District	Pauma Valley Treatment Plant	1,014	0.5
Rancho Santa Fe Community Services District	Santa Fe Valley WRF Rancho Santa Fe WRF	9,153	179
Whispering Palms Community Services District	Whisperings Palms WPCF	2,941	92
	Total	**28,940**	**711**

WWTF – wastewater treatment facility, WRF – water reclamation facility or water recycling facility, WPCF = Water Pollution Control Facility
*Flow treated at the facilities for these districts are not available or cannot be separated out. The average wastewater generated per capita (75 gallons per capita per day) and the service area population in unincorporated county of each district with data available was used to estimate the wastewater flow (Pauma Valley Treatment Plant flow is not included in the average per capita calculation due to its low flow).
**2018 population within each member agency's service area in unincorporated county was based on GIS analysis, wastewater service area of each agency may differ from water service area
***Assumes the per capita wastewater generated in the unincorporated county of each agency is the same as the rest of the agency's service area
Energy Policy Initiatives Center, University of San Diego 2021

4.9.5 Wastewater Flow Treated at On-site Systems

Communities with dispersed population often treat wastewater on-site or near the origins. On-site wastewater treatment is commonly done through a septic system, or an underground wastewater treatment system. The population with septic systems is calculated based on the difference between the county population and the populations served by centralized districts discussed in the above Section 4.9.1 through Section 4.9.3. The estimated population and wastewater flow are provided in Table 50.

Table 50 Wastewater Flow Treated at On-site Systems (Unincorporated County of San Diego, 2019)

Wastewater Collection	Service Area Population in the Unincorporated County*	Wastewater Flow** (Million gallons/year)	Wastewater Flow (Gallons per capita per day)
Total	479,844	9,916	57
San Diego County Sanitation District	117,432	3,234	75
Individual Wastewater Districts	28,940	711	67
SDCWA Member Agencies	187,103	2,947	43
Septic Systems	**146,369**	**3,025**	**57**

*Population with septic systems is calculated based on the difference between total county population and the populations served by centralized districts
**Wastewater flow with septic system is calculated based on the population and the average gallons wastewater generated per capita per day of the centralized district
Energy Policy Initiatives Center, University of San Diego 2023

4.9.6 Emissions from Wastewater

Emissions from wastewater treatment depend on the treatment processes. A centralized conventional WWTP includes aerobic systems to degrade dissolved organics. Additional treatments include nitrification/denitrification (to oxidize or remove nitrogenous waste), anaerobic digestion (to degrade organics to produce digester gas), and combustion of digester gas. A decentralized wastewater treatment system, such as a septic system, only includes physical settling and biological activities without other processes typically at a centralized WWTP.

Among the WWTPs listed in Table 47 through Table 49, only Point Loma WWTP, Encina WPCF, and San Luis Rey WWTP use the anaerobic digestion process. The emissions from wastewater at these facilities are calculated based on the wastewater flow and the process emission factor (combustion of digester gas) from each facility. For all other centralized facilities, only the aerobic process is used. The Rancho Del Campo WWTP is the only plant that uses the nitrification/denitrification process.[93] The emissions were calculated based on population served, the U.S. Community Protocol Method WW.7, Method WW.8 for process emissions, and Method WW.12 for fugitive emissions.[94] For the wastewater treated at septic systems, CH_4 emissions were calculated based on the population served and the septic system emission factor. The key inputs and GHG emission from wastewater in 2019 are shown in Table 51.[95]

Table 51 Key Inputs and GHG Emissions from Wastewater (Unincorporated County of San Diego, 2019)

<table>
<tr><th colspan="5">Wastewater Treated at WWTPs with Anaerobic Digestion</th></tr>
<tr><td>Wastewater Treatment Facilities</td><td>Wastewater Flow (Million gallons/year)</td><td colspan="2">Emission Factor* (MT CO_2e/million gallon)</td><td>GHG Emissions (MT CO_2e)</td></tr>
<tr><td>Point Loma WWTP</td><td>3,965</td><td colspan="2">0.30</td><td>1,203</td></tr>
<tr><td>San Luis Rey WWTP</td><td>330</td><td colspan="2" rowspan="2">1.37</td><td rowspan="2">850</td></tr>
<tr><td>Encina WPCF</td><td>290</td></tr>
<tr><th colspan="5">Wastewater Treated at WWTPs without Anaerobic Digestion</th></tr>
<tr><td>Wastewater Treatment Process</td><td>Population Served</td><td>Process Emissions (MT CO_2e)</td><td>Fugitive Emissions (MT CO_2e)</td><td>GHG Emissions (MT CO_2e)</td></tr>
<tr><td>With nitrification/denitrification</td><td>945</td><td>2</td><td>4</td><td rowspan="2">1,927</td></tr>
<tr><td>Without nitrification/denitrification</td><td>136,457</td><td>163</td><td>1,758</td></tr>
<tr><th colspan="5">Wastewater Treated with Septic Systems</th></tr>
<tr><td colspan="2">Population Served</td><td colspan="2">Emission Factor (g CH_4 per person per day)</td><td>GHG Emissions (MT CO_2e)</td></tr>
</table>

93 GHG sources and processes at County-owned facility provided by County (January 28, 2021 and February 19, 2021).

94 ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix F. Wastewater and Water Emission Activities and Sources.

95 CARB: Documentation of California's 2000–2018 GHG Inventory, last modified November 6, 2020. 4D1 – Domestic Wastewater Treatment and Discharge.

146,369	10.7	14,291
	Total GHG Emissions (MT CO_2e)	**18,000**

WWTP – wastewater treatment plant, WPCF = Water Pollution Control Facility
*Point Loma WWTP's emission factor is based on 2019 total influent flow and reported GHG emissions at the facility. Encina WPCF's emission factor was based on a 2013 study and used as proxy for San Luis Rey WWTP, because both plants have similar wastewater treatment processes.
GHG emissions for each category are rounded to the nearest thousands. Values are not rounded in the intermediary steps in the calculation.
Energy Policy Initiatives Center, University of San Diego 2023

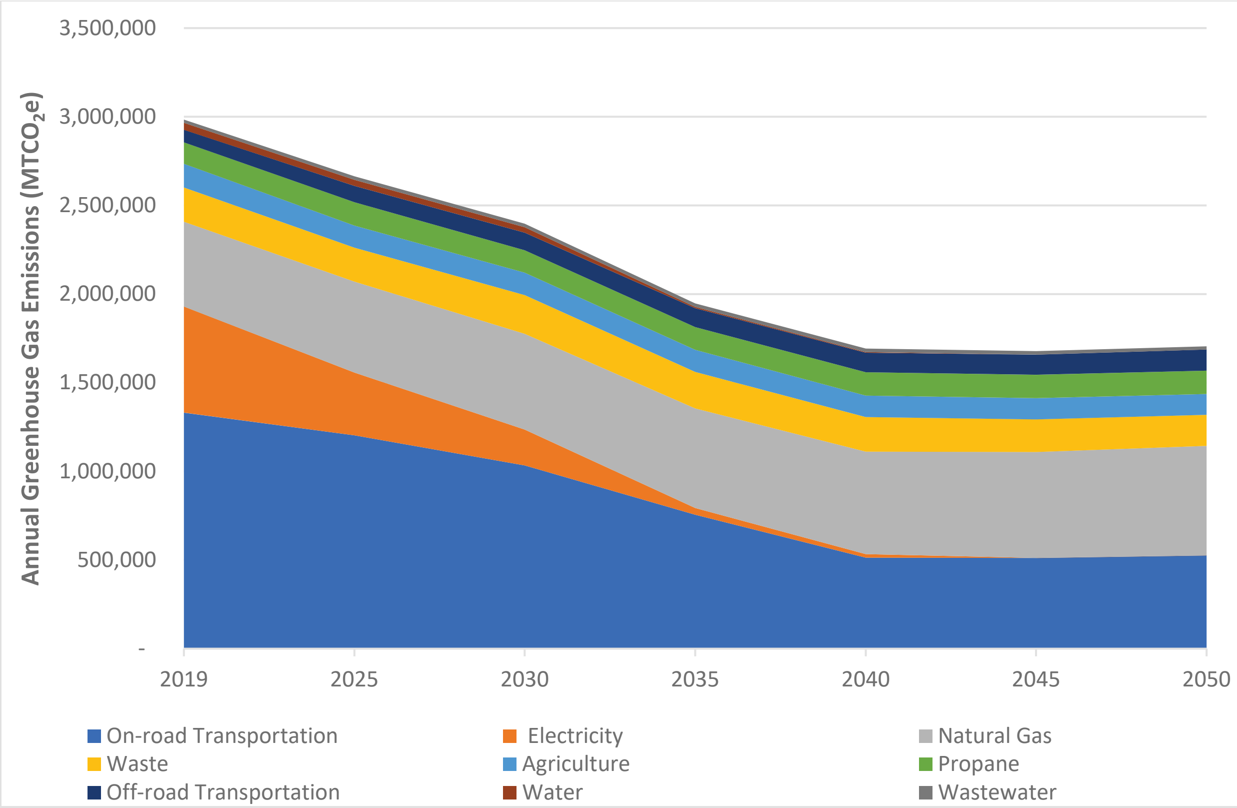
5. Emissions Projection Through 2050

The 2019 GHG emissions were projected through 2050 based on: (1) population, housing, and job growth in the county and (2) the future impact of adopted Federal and California regulations, policies, and programs in place in 2022 (i.e., at the end of the final calendar year) that reduce GHG emissions. The projections also account for growth in the County's government operations (see *County of San Diego Local Government Operations Greenhouse Gas 2019 Inventory and Projections* for more details). The total and distribution of projected emissions by category are presented in Table 52 and Figure 4. Note that projected GHG emissions for 2025 do not reflect County operations because year 2025 projections were not included in the *County of San Diego Local Government Operations Greenhouse Gas 2019 Inventory and Projections*.

Table 52 Total and Breakdown of Projected GHG Emissions (Unincorporated County of San Diego)

Emissions Category	Projected GHG Emissions (MT CO_2e)					
	2025	**2030**	**2035**	**2040**	**2045**	**2050**
On-road Transportation	1,204,000	1,033,000	756,000	513,000	512,000	527,000
Electricity	354,000	202,000	38,000	20,000	-	-
Natural Gas	512,000	540,000	561,000	579,000	597,000	616,000
Waste	192,000	219,000	206,000	194,000	184,000	175,000
Propane	131,000	127,000	129,000	131,000	132,000	133,000
Agriculture	125,000	127,000	124,000	122,000	120,000	118,000
Off-road Transportation	92,000	99,000	106,000	110,000	114,000	118,000
Water	35,000	31,000	8,000	4,000	-	-
Wastewater	19,000	19,000	19,000	19,000	19,000	19,000
Total	**2,664,000**	2,397,000	1,947,000	1,693,000	1,678,000	1,705,000

The projected GHG emissions include the impact of population, housing, and employment growth, as well as the future impact of adopted Federal and California Regulations, policies and programs that reduce GHG emissions as of 2022.
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
Energy Policy Initiatives Center, University of San Diego 2023



Note: the projected GHG emissions include the anticipated impact of population, housing, and employment growth, as well as the future impact of adopted Federal and California Regulations, policies and programs that reduce GHG emissions as of 2022.

Figure 4 Total and Breakdown of Projected GHG Emissions (Unincorporated County of San Diego)

6. Methods to Project Emissions Through 2050

6.1 On-road Transportation

6.1.1 Federal and State Regulations Included in the Emissions Projection

6.1.1.1 Heavy-Duty Vehicle Regulations

The default outputs of CARB's Mobile Source Emissions Inventory EMFAC2021 model were used to determine the average vehicle emission rates for the San Diego region.[96] The average vehicle emission rates for the San Diego region were used as proxies for the county. The EMFAC2021 model outputs include effects of the following federal and State regulations related to tailpipe GHG emissions reductions that were adopted through 2020:

- Heavy-Duty Warranty Phase 1: amendments to the heavy-duty engine warranty regulations;
- Innovative Clean Transit: requirements for public transit agencies to transition to a 100% zero-emission bus fleet;
- Amendments to Heavy-Duty Vehicle Inspection Program and Periodic Smoke Inspection Program: amendments to reduce PM from diesel-powered vehicles;
- Zero Emission Airport Shuttle Bus: requirements for airport shuttle fleets to fully transition to zero emission;

[96] CARB: EMission FACtors model, EMFAC2021 v1.0.2, May 2, 2022.

- Advanced Clean Truck: requirements for zero-emission truck/classis sales; and
- Heavy-Duty Omnibus: updates to heavy-duty NOx emissions standards.[97]

6.1.1.2 Light-Duty Vehicle: Advanced Clean Cars II Regulation

Existing federal and state regulations to reduce emissions from light-duty vehicles are included in the previous EMFAC2017 and carried over in EMFAC2021. No new light-duty vehicle regulations were modeled in EMFAC2021. EMFAC2021 does not include the effect of Advanced Clean Cars II (ACCII).

In August 2022, CARB adopted the ACCII regulations that established standards for new post-2026 model year light-duty vehicles. ACCII amended (1) the low-emission vehicle (LEV) regulations to strengthen standards for light-duty vehicles and trucks to reduce smog-forming emissions, and (2) the zero-emission vehicle (ZEV) regulations to require an increasing number of ZEVs to meet air quality and climate change emissions standards.[98] The ZEV amendments support Governor Newsom's Executive Order N-79-20 that requires all new passenger vehicles sold in California to be zero emissions by 2035.[99]

6.1.2 Projected Emissions from On-Road Transportation

Projected annual VMT was estimated based on the average weekday VMT for the county provided by SANDAG using the Series 14 Forecast and activity-based model (ABM2+). The VMT projection is based on the SANDAG DS39 growth assumption for the county. Weekday O-D VMT projections for each trip type in 2025, 2035, and 2050 are shown in Table 53, with linear interpolations in between.[100] Employee commute VMT projections assume that 2019 employee commute VMT levels were grow in proportion to growth in County employees. Employee commute projections include vehicle tailpipe emissions and indirect emissions from increased electric load from electric vehicles.

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[97] CARB: EMFAC2021 Volume III Technical Document, Version 1.0.1 (April 2021). Section 1.3.5 Regulations and Policies includes a list of polices and regulations covered in EMFAC2021. The Technical Document discusses the federal SAFE Vehicle Rules and Actions, however, the latest EMFAC2021 v.1.0.2 does not include the impact of the SAFE Rule.

[98] CARB: Advanced Clean Cars II.

[99] *Id.*

[100] 2025, 2035, and 2050 VMT files were provided by Fehr & Peers to EPIC, February 13, 2023. SANDAG Activity Based Model 2+ Release v14.2.2, 2021 Regional Plan EIR Alternative 2, Year 2025 (Scenario 507), Year 2035 (Scenario 505), and Year 2050 (Scenario 506). Fehr & Peers developed a procedure to adjust County VMT provided by SANDAG for County such that military and tribal lands were not included as part of the Unincorporated County. Fehr & Peers (February 17, 2023), *Military and Tribal VMT Adjustment for the San Diego County CAP Model Scenarios* [Memorandum].

Table 53 Projected County VMT Through 2050

Year	Projected VMT by Trip Type (Miles/Weekday)		Total Projected County VMT (100% * I-I + 50% * I-E/E-I) (Miles per Weekday)	Total Projected County VMT (Miles per Year)
	Internal-Internal (I-I) Trips	External-Internal/Internal-External (I-E/E-I) Trips		
2025	1,564,362	15,051,380	9,090,052	3,154,247,996
2030	1,570,948	15,549,723	9,345,809	3,242,995,681
2035	1,577,533	16,048,065	9,601,566	3,331,743,367
2040	1,608,203	16,370,036	9,793,221	3,398,247,707
2045	1,638,873	16,692,007	9,984,876	3,464,752,048
2050	1,669,543	17,013,977	10,176,531	3,531,256,388

2025, 2035, and 2050 VMT projection from SANDAG Series 14 (DS39 and ABM2+) were adjusted for the County such that military and tribal lands were not considered as part of the county. The conversion factor from miles per weekday to miles per year is 347.
VMT in the rest of the forecast years are interpolated linearly. The conversion factor from miles per weekday to miles per year is 347.

Fehr & Peers 2023, Energy Policy Initiatives Center, University of San Diego 2023

Federal and State policies and regulations through 2020 discussed in Section 6.1.1.1 reduce vehicle tailpipe emissions but add additional electric load from ZEVs through 2050. Using the EMFAC2021 default scenario, the percentage of miles driven by electric vehicles (e-VMT) of total VMT and the EV efficiency are calculated and applied to county VMT. The additional electric load from ZEVs are shown in Table 54.[101] The calculation method for the county-wide electricity emission factor is discussed in Section 6.2.2.

Table 54 Additional Electric Vehicle Load Through 2050 with Federal and State Regulations in EMFAC2021

Year	Ratio of e-VMT to Total VMT*	New County e-VMT**	Electric Vehicle Efficiency kWh/mile	Electricity Use from New County e-VMT (MWh)	County-wide Emission Factor*** (lb CO_2e/MWh)	Additional Emissions from Electric Load (MT CO_2e)
2025	5.1%	117,578,336	0.38	44,201	249	5,209
2030	7.7%	207,808,712	0.41	86,185	132	5,605
2035	10.1%	292,279,802	0.46	135,398	23	1,653
2040	11.6%	349,978,450	0.50	174,290	11	1,001
2045	12.4%	386,672,658	0.52	201,976	-	-
2050	12.8%	411,116,603	0.54	221,699	-	-

*EMFAC2021 default for San Diego County is applied to the unincorporated county
**New county e-VMT is the difference between the e-VMT in a forecast year and the 2019 baseline
***County-wide emission factor is based on grid electricity supply and behind-the-meter PV supply assumptions in Section 6.2.2
Results are from CARB EMFAC2021 model. The model includes all key federal and State regulations related to tailpipe GHG emissions reductions that were adopted through 2020.
e-VMT: electric vehicle miles traveled.
CARB 2022, Energy Policy Initiatives Center, University of San Diego 2023

[101] CARB: EMission FACtors model, EMFAC2021 v1.0.2, May 2, 2022.

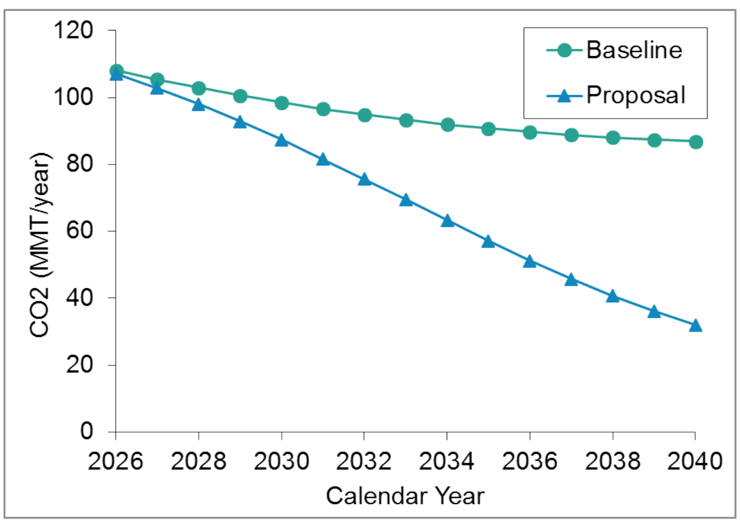
Using the EMFAC2021 default scenario, the average vehicle emission rate (g CO_2e/mile) for each target year is calculated based on the distribution of VMT for each vehicle class and its emission rate. The net projected emissions with the impact of federal and State polices and regulations through 2020 is the difference between vehicle tailpipe emissions and additional emissions from the electric load. The emissions through 2050 are shown in Table 55.

Table 55 Projected Emissions Through 2050 with Federal and State Regulations in EMFAC2021

Year	Total County VMT (Miles per Year)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions (MT CO_2e)
2025	3,154,247,996	380	1,198,364
2030	3,242,995,681	343	1,111,344
2035	3,331,743,367	317	1,055,457
2040	3,398,247,707	302	1,027,554
2045	3,464,752,048	296	1,025,657
2050	3,531,256,388	296	1,044,035

Results are based on CARB EMFAC2021 model. The model includes all key federal and State regulations related to tailpipe GHG emissions reductions that were adopted through 2020.
CARB 2022, Energy Policy Initiatives Center, University of San Diego 2023

The latest version of EMFAC2021 does not include the impact of ACCII. The next version of EMFAC model, EMFAC202Y, will include the impact of ACCII, as well as other light-duty vehicle regulations and heavy-duty vehicle regulations passed after the adoption of EMFAC2021.[102] However, CARB estimated the anticipated statewide downstream tank-to-wheel CO_2 emission benefits of ACCII, starting 2026 through 2040 (Figure 5).



Note: Adapted from CARB October 2022 Public Workshop for the EMFAC202Y Model, Presentation Slide 36, the difference between baseline and proposal CO_2 emissions is due to projected Advanced Clean Car II Regulations

[102] CARB Presentation EMFAC202Y: An Update to California on-road Mobile Source Emissions Inventory (October 12, 2022).

Figure 5 Anticipated Light-Duty Emission Benefits from Advanced Clean Cars II Regulations – Project Statewide Downstream Tank-to-wheel Emissions

It should be noted that no San Diego regional emission benefits or additional electric load due to the ZEVs are available as of March 2023. For this document and projections, it is assumed that the impact of ACCII in the county will be the same as its impact statewide, and the benefits post-2040 will be the same as 2040 benefits.

Only light-duty vehicles are subject to ACCII, so the emissions benefits from ACCII were applied only to light-duty vehicles in the county. The additional electric load due to the new ZEVs from ACCII were not estimated due to lack of electricity load data. However, in 2045 when the electricity supply is mandated to be zero-emissions, any ZEV will have zero impact on electricity emissions. The total projected emissions from on-road transportation, including estimated ACCII effects only on ZEV emissions, are shown in Table 56.[103]

Table 56 Projected GHG Emissions from On-Road Transportation Through 2050

Year	% CO_2 LDV/CO_2e All Vehicles*	County LDV CO_2 - EMFAC21 (MT CO_2e)	Additional Electric Load - EMFAC21 (MT CO_2e)	County Non-LDV GHG - EMFAC21 (MT CO_2e)	County LDV CO_2 - EMFAC21 + ACCII Impact (MT CO_2e)	Community Emissions (MT CO_2e)	Non-unincorporated County Employee Commute Emissions (MT CO_2e)	Total Emissions (MT CO_2e)
2025	79.2%	949,304	5,209	249,060	949,304	1,204,000	--	1,204,000
2030	79.1%	879,222	5,605	232,122	780,263	1,018,000	15,000	1,033,000
2035	79.7%	841,355	1,653	214,102	529,267	745,000	11,000	756,000
2040	80.3%	825,595	1,001	201,959	303,686	507,000	6,000	513,000
2045	80.3%	823,192	-	202,465	302,802	505,000	7,000	512,000
2050	79.4%	829,442	-	214,593	305,101	520,000	7,000	527,000

*Results are based on CARB EMFAC2021 model. The model includes all key federal and State regulations related to tailpipe GHG emissions reductions that were adopted through 2020.
ACCII: Advanced Clean Cars II Regulations
LDV: light-duty vehicles with gross vehicle weight rating < 8,500 lbs.
The impact of ACCII is estimated based on the difference in CO_2 emissions between baseline and proposal scenario in Figure 5
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
2025 Projections are not available for County operations.
CARB 2022, Energy Policy Initiatives Center, University of San Diego 2023

6.2 Electricity

6.2.1 State Regulations, Policies and Programs Included in the Projection

6.2.1.1 Renewables Portfolio Standard (RPS) – SB100 and SB1020

SB 100, the 100 Percent Clean Energy Act of 2018, adopts a 60% RPS for all of California's retail electricity suppliers by 2030. The legislation also provides goals for the intervening years before 2030

[103] CARB: EMission FACtors model, EMFAC2021 v1.0.2, May 2, 2022. CARB Presentation EMFAC202Y: An Update to California on-road Mobile Source Emissions Inventory (October 12, 2022). Data behind the CO_2 figure on Slide 36 were provided by CARB EMFAC team to EPIC, January 23, 2023.

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.[104]

SB1020, the Clean Energy, Jobs, and Affordability Act of 2022, adopts two interim targets for all retail electricity sales to end-use customers, 90% renewable and zero-carbon electricity by 2035 and 95% renewable and zero-carbon electricity by 2040.[105] The statewide renewables and zero-carbon targets are shown in below Figure 6.

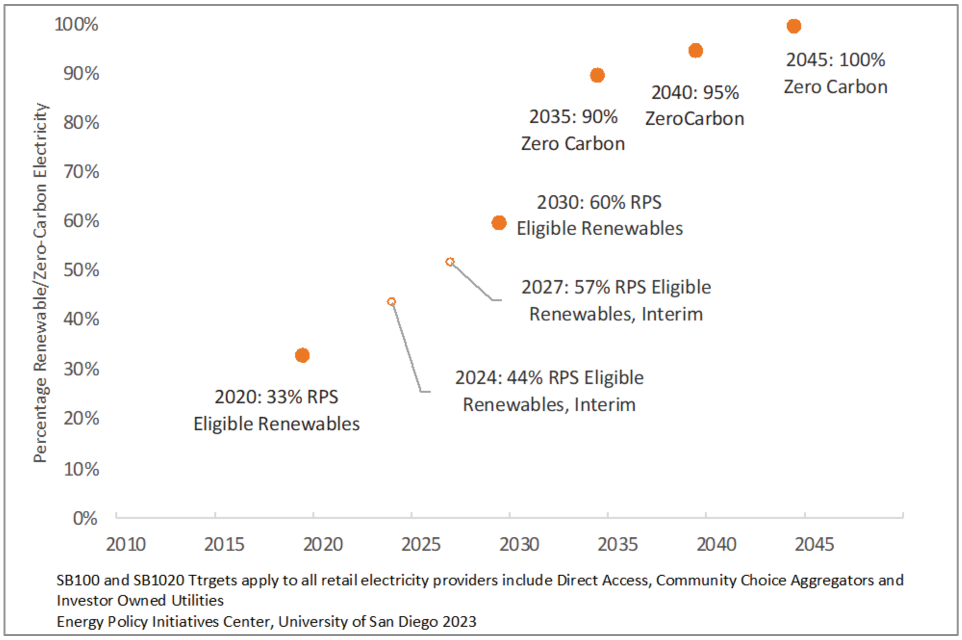


Figure 6 SB100 and SB1020 Renewables and Zero-Carbon Targets

6.2.1.2 California Solar Programs, Policies, and Mandates

California has several policies and programs to encourage customer-owned, behind-the-meter PV systems, such as the California Solar Initiative, New Solar Home Partnership, Net Energy Metering, and electricity rate structures designed for solar customers.[106] The 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.[107] The latest California 2022 Building Energy Efficiency

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[104] SB 100 (de León): California Renewables Portfolio Standard Program: emissions of greenhouse gases (2017–2018). The interim RPS targets are 44 percent by 2024 and 52 percent by 2027 from eligible renewable energy resources.

[105] SB1020 (Laird): the Clean Energy, Jobs, and Affordability Act of 2022 (2021–2022).

[106] The energy demand forecast used in this document is based on CEC 2021 Integrated Energy Policy Report (2021 IEPR). The PV models used in 2021 IEPR included an extension of federal tax incentives but did not include the impact of the proposed Net Energy Metering change (NEM 3.0) from the California Public Utilities Commission (CPUC). The CPUC NEM 3.0 proceeding was in progress during the 2021 IEPR preparation. CEC: Final 2021 Integrated Energy Policy Report Volume IV: California Energy Demand Forecast (February 2022), accessed March 23, 2023.

[107] 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

Standards, which went into effect on January 1, 2023, expands the PV requirement to non-residential buildings. In addition, the 2022 Code encourages efficient electric heat pumps and establishes electric-ready requirements for new residential construction.[108]

The California Energy Demand 2021–2035 Forecast, developed by the CEC, has projections for PV capacity from behind-the-meter PV adoption in the SDG&E planning area through 2035, including the impact of the residential and non-residential PV mandates.
The baseline demand forecast provides three cases: high-demand, mid-demand, and low-demand. The PV projection from 2020–2035 in the SDG&E planning area mid-demand case is used to forecast the PV generation in the county.[109]

The California Distributed Generation (DG) Statistics database includes capacities of behind-the-meter PV systems interconnected in a jurisdiction in a given year for each of the three Investor-Owned Utility (IOU) planning areas, including SDG&E. The DG Statistics database also provides detailed information about the behind-the-meter PV systems installed in a jurisdiction from the start year of incentive programs through the current year. This provides a historical record used to determine the capacity in GHG inventory years and can also help determine trends in PV installation.

A comparison of the estimated capacity and electricity generation from PV systems in the county and in the SDG&E planning area is given in Table 57.[110]

Table 57 Behind-the-meter PV Capacity and Estimated Electricity Generation

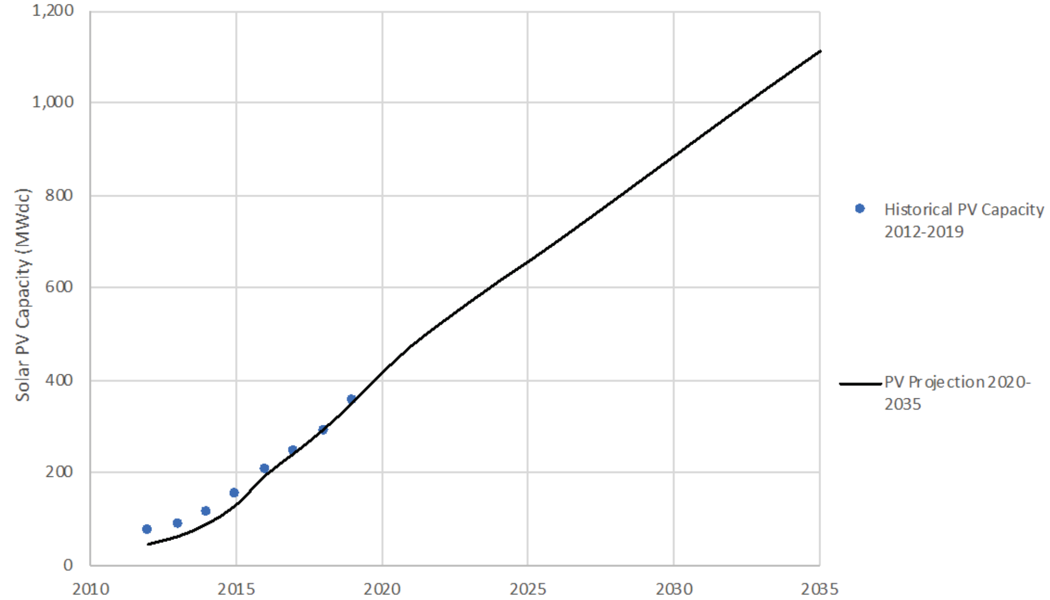
Year	Unincorporated County*		SDG&E Planning Area**	Historical County to SDG&E Ratio of Electricity Generation from PV
	PV Capacity (MW)	Estimated Electricity Generation (GWh)	Estimated Electricity Generation (GWh)	
2016	206	325	1,140	28%
2017	245	386	1,431	27%
2018	293	462	1,733	27%
2019	358	565	2,085	27%

*Estimated electricity generation based on PV capacity and default 18% capacity factor.
**California Energy Demand Baseline 2021-2035 Forecast mid-demand case
California Distributed Generation Statistics 2021, CEC 2022, Energy Policy Initiatives Center, University of San Diego 2022

For future years, the electricity generation and capacity of behind-the-meter PV systems in the county are estimated based on the PV generation in CEC's mid-demand forecast for SDG&E's planning area, and the average ratio of PV generation in the county to that of SDG&E's planning area from 2014–2019 (30%). Because of California's solar programs, policies and mandates, the estimated PV capacity in 2035

Requirements for Photovoltaic System. For the requirements on newly constructed and detached ADU, see Section 9.3.5 Accessory Dwelling Units.
[108] CEC: 2022 Building Energy Efficiency Standards.
[109] CEC: California Energy Demand Forecast, 2021–2035 Baseline Forecast – Mid Demand Case, accessed September 16, 2022.
[110] The capacity of all interconnected PV systems in the Unincorporated County was from the California Distributed Generation Statistics NEM Currently Interconnected Data Set (current as of October 31, 2020), download date: January 25, 2021. National Renewable Energy Laboratory: Residential PV Resources Classes, Mean DC Capacity Factor.

in the county is projected to be 1,100 megawatts (MW). As there are no statewide PV projections beyond 2035, it is assumed that the PV capacity from State programs beyond 2035 will be fixed at 2035 levels. The trend of behind-the-meter PV in the county is shown in Figure 7.



Source:
Source of historical capacity: California Distributed Generation Statistics, 2022.
Source of capacity trend: California Energy Demand 2021-2035 Baseline Forecast in San Diego planning area, mid-demand scenario (Jan 2022 version).
Energy Policy Initiatives Center, University of San Diego, 2022

Figure 7 Behind-the-meter PV Historical and Projected Trend in San Diego (2012–2035)

6.2.1.3 California Energy Efficiency Programs

In September 2021, the California Public Utilities Commission (CPUC) adopted energy efficiency goals for ratepayer-funded energy efficiency programs (Decision 21-09-037). The adopted energy saving goals for SDG&E's service territory are given in the Decision on an annual basis from 2022 to 2032.[111] The sources of the energy savings include, but are not limited to, rebated technologies, building retrofits, behavior-based initiatives, and codes and standards.[112]

To evaluate the impact of the energy efficiency programs in the county, the total energy savings in SDG&E's service territory by 2032 are allocated to the county using a ratio of the County's natural gas and electricity demand to those of SDG&E's entire service territory. The 2019 ratios are 10% for electricity and 16.1% for natural gas.[113] The utility's energy efficiency goal is not estimated by the CPUC beyond 2032; therefore, it is assumed the annual electricity and natural gas savings post-2032 from energy efficiency programs will be the same as in 2032. SDG&E's service territory electricity savings

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[111] CPUC: Decision 21-09-037, Adopting Energy Efficiency Goals for 2022-2032, accessed September 16, 2022. SDG&E's electricity service territory is larger than San Diego region.
[112] Guidehouse: 2021 Energy Efficiency Potential and Goals Study (April 23, 2021), accessed September 16, 2022. Rebated technologies are the energy efficiency technologies from the utility's historic incentive programs, including equipment and retrofits. Existing and future Codes and Standards included in the Study is discussed in Section 3.9 Codes and Standards.
[113] SDG&E's service territory demand is from California Energy Demand Forecast, 2021–2035 Baseline Forecast – Mid Demand Case, accessed September 16, 2022. 2019 is the latest year with historical data in both the County and SDG&E service territory.

were allocated accordingly to county, as shown in Table 58.[114]

Table 58 Estimated Electricity Savings from California Energy Efficiency Program

Year	Electricity Savings* (GWh)	
	SDG&E Service Territory	Allocation of Savings to County by Electric Demand
2025	1,114	115
2030	1,934	200
2035	2,175	225
2040	2,175	225
2045	2,175	225
2050	2,175	225

*Include transmission and distribution losses.
SDG&E service territory savings are the cumulative based on the 2021-2035 annual saving goals in CPUC Decision 21-09-037.
Energy Policy Initiatives Center, University of San Diego 2023

6.2.2 Projected Emissions from Electricity

Electricity use through 2050 is projected using the 2019 baseline electricity use in residential and non-residential sectors, projected housing and employment growth, projected behind-the-meter PV growth, and electricity savings from California energy efficiency programs. The method is illustrated in Figure 8.

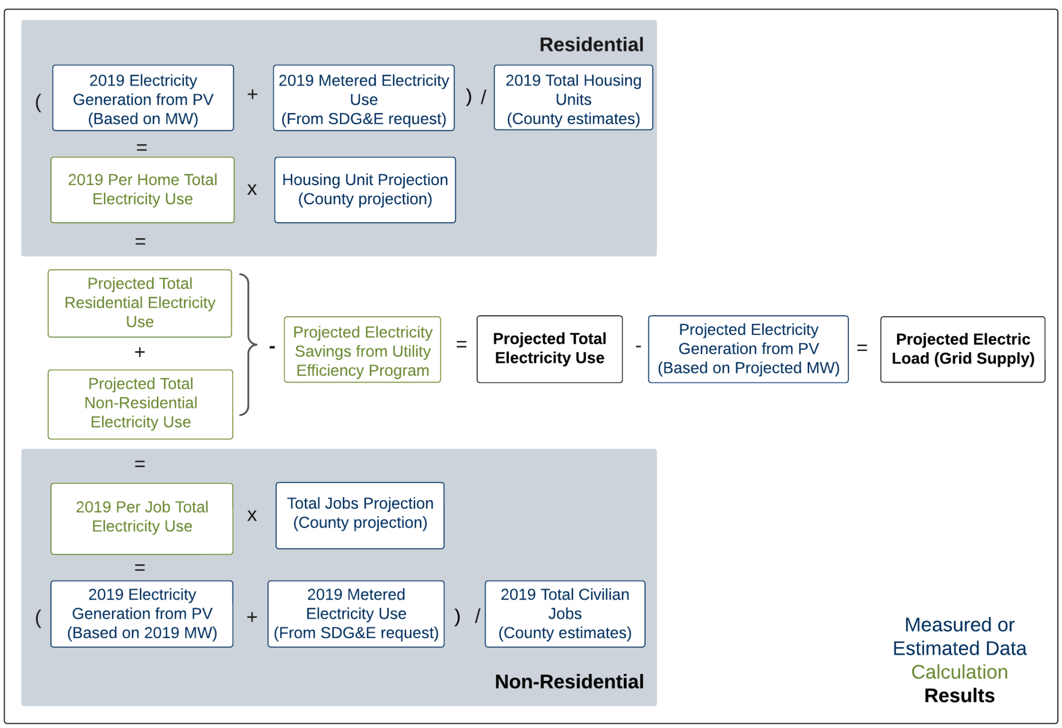

Figure 8 Method to Project Electricity Use and Grid Supply

[114] CPUC: Decision 21-09-037, Adopting Energy Efficiency Goals for 2022-2032, accessed September 16, 2022. The 2022 and beyond goals are given on an annual basis for each year from 2022 to 2032.

The electricity supplied by behind-the-meter PV is assumed to be 100% renewable with zero GHG emissions. All retail service providers supplying electricity through the grid will have to meet the RPS requirements as discussed in Section 6.2.1.1, and achieve 100% zero-carbon (i.e., zero GHG emissions) by 2045.[115] The projected emissions from electricity are provided in Table 59. Because County government buildings and facilities would purchase electricity from 100% renewable sources, County operations are projected to produce zero GHG emissions.

Table 59 Projected GHG Emissions from Electricity Through 2050

Year	Projected Total Electricity Use (GWh)	Projected Electricity Generated from Behind-the-meter Solar PV (GWh)	Projected Grid Electricity Supply (GWh)	Grid Supply Emission Factor (lb CO_2e/MWh)	County-wide Emission Factor (lb CO_2e/MWh)	GHG Emissions (MT CO_2e)
2025	2,509	1,035	1,474	489	287	354,000
2030	2,520	1,397	1,123	367	163	202,000
2035	2,591	1,756	835	92	30	38,000
2040	2,667	1,756	911	46	16	20,000
2045	2,744	1,756	988	-	-	-
2050	2,820	1,756	1,064	-	-	-

Forecast year data are projections based on future impact of State policies and programs and baseline year 2019 status.
County-wide emission factor is calculated based on the percentage of electricity supplied by behind-the-meter PV and the grid, and their emission factors. Electricity generated from behind-the-meter PV is assumed to be 100% renewable and zero emissions.
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
Energy Policy Initiatives Center, University of San Diego 2023

6.3 Natural Gas

6.3.1 State Regulations, Policies, and Programs

6.3.1.1 California Energy Efficiency Programs

Similar to methods for projecting electricity, described in Section 6.2.1.3, the adopted energy saving goals for SDG&E's service territory given in the CPUC Decision 21-09-037 are allocated to the county using a ratio of the county's natural gas demand to that of SDG&E's entire service territory. The utility's energy efficiency goal is not estimated by the CPUC beyond 2032; therefore, it is assumed the electricity and natural gas savings post-2032 from energy efficiency programs will be the same as in 2032. The natural gas savings from the energy efficiency programs are shown in Table 60.[116]

[115] SDG&E, electric suppliers, or local Community Choice Energy providers may provide electricity with renewable or zero carbon content beyond RPS requirements. These are taken into account as GHG reductions from a local measures, not part of these projections.
[116] CPUC: Decision 21-09-037, Adopting Energy Efficiency Goals for 2022-2032, accessed September 16, 2022. The 2022 and beyond goals are given on an annual basis for each year from 2022 to 2032.

Table 60 Estimated Natural Gas Savings from California Energy Efficiency Program

Year	Natural Gas Savings (Million Therms)	
	SDG&E Service Territory	Allocation of Savings to County by Natural Gas Demand
2025	12.5	1.5
2030	17.5	2.2
2035	17.5	2.2
2040	17.5	2.2
2045	17.5	2.2
2050	17.5	2.2

SDG&E service territory savings are cumulative based on 2021-2035 annual saving goals in CPUC Decision 21-09-037.
Energy Policy Initiatives Center, University of San Diego 2023

6.3.2 Projected Emissions from Natural Gas

Natural gas use through 2050 is projected using the 2019 baseline in the residential and non-residential sectors, projected housing and employment growth, and natural gas savings from the California Energy Efficiency Program. The natural gas emission factor is fixed through 2050. The projected emissions from natural gas are provided in Table 61.

Table 61 Projected GHG Emissions from Natural Gas Through 2050

Year	Projected Total Natural Gas Use (Million Therms)	Natural Gas Savings from Energy Efficiency Programs (Million Therms)	Modified Total Natural Gas Use (Million Therms)	Emission Factor (MT CO_2e/ Therm)	Community GHG Emissions (MT CO_2e)	County Operations Emissions (MT CO_2e)	Total GHG Emissions (MT CO_2e)
2025	95.5	1.5	94.0	0.00545	512,000	--	512,000
2030	99.5	2.2	97.3	0.00545	531,000	9,000	540,000
2035	103.4	2.2	101.2	0.00545	552,000	9,000	561,000
2040	106.7	2.2	104.5	0.00545	570,000	9,000	579,000
2045	110.0	2.2	107.9	0.00545	588,000	9,000	597,000
2050	113.3	2.2	111.2	0.00545	606,000	10,000	616,000

Forecast year data are projections based on future impact of State policies and programs and baseline year 2019 status.
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
2025 Projections are not available for County operations.
Energy Policy Initiatives Center, University of San Diego 2023

6.4 Waste

Emissions from the decomposition of organic material were projected in two parts: (1) CH_4 emissions from county-generated mixed waste through 2050; and (2) CH_4 emissions through 2050 from biodegradable waste that has been in placed at landfills located within the county as of 2019.[117]

[117] ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019), Appendix E: Solid Waste Emission Activities and Sources - SW.1 Methane Emissions from Landfills and SW.4 community-Generated Waste Sent to Landfills.

6.4.1 Projected Emissions from County Waste Disposal

The solid waste disposal projection through 2050 was based on the population growth in the county and county per capita solid waste disposed in 2019, 5.7 lbs per capita per day. The projected emissions from disposal were calculated by multiplying the disposal amount with the emission factor for mixed solid waste used for 2019.[118] The projected total waste disposal and corresponding GHG emissions from the solid waste category are given in Table 62.

Table 62 Projected Solid Waste Disposal and GHG Emissions from Solid Waste Through 2050

Calendar Year	Waste Disposal (Tons)	Mixed Waste Emission Factor (MT CO_2e/Short Ton)	Oxidation Rate	Projected Total GHG Emissions (MT CO_2e)	San Diego Regional CH_4 Capture Rate	Projected Remaining GHG Emissions (MT CO_2e)
2025	508,142	1.10	10%	501,670	85%	75,250
2030	510,553	1.10	10%	504,051	85%	75,608
2035	512,965	1.10	10%	506,431	85%	75,965
2040	516,593	1.10	10%	510,013	85%	76,502
2045	520,221	1.10	10%	513,595	85%	77,039
2050	523,850	1.10	10%	517,177	85%	77,577
Energy Policy Initiatives Center, University of San Diego 2023						

6.4.2 Projected Emissions from In-Boundary Landfills

For the closed Viejas Landfill, emissions through 2050 were projected using the IPCC first-order decay model and the default values for percentage of ANDOC in California embedded in the CARB Landfill Gas Tool.[119] For the other closed landfills (i.e., Bonsall, Jamacha, and Valley Center Landfills), the projected decay rate from Viejas Landfill is applied to these landfills' 2019 emissions. The projected emissions from closed landfills are shown in Table 63.

Table 63 Projected Emissions from Closed Landfills Though 2050

Year	Projected GHG Emissions (MT CO_2e)				
	Bonsall Landfill	Jamacha Landfill	Valley Center Landfill	Viejas Landfill	Total Closed Landfills
2025	1,798	1,724	766	445	4,734
2030	1,627	1,560	693	403	4,283
2035	1,472	1,411	627	365	3,876
2040	1,332	1,277	568	330	3,507
2045	1,206	1,155	514	299	3,173
2050	1,091	1,045	465	270	2,871
Energy Policy Initiatives Center, University of San Diego 2023					

118 SB 1383, a bill that sets statewide goals to reduce disposal of organic waste in landfills, is implemented at the county and local level. The GHG reduction from reducing organic waste in landfills would be taken into account as part of any local actions to implement SB 1383, not as part of these projections.

119 CARB: Landfill Gas Tool (updated September 24, 2021). The 2021 version of the CARB Landfill Gas Tool only shows results through 2024, EPIC calculated the emissions through 2050 using the same methods and assumptions as the ones in the Tool, January 24, 2023.

The future emissions in a forecast year were also estimated from the waste already in place at the active landfills, Borrego and Otay Landfills. For the Borrego landfill, no post-2019 waste disposal at the landfill was included because (1) Borrego landfill accepted waste only from the county and (2) all landfill emissions from future county-generated waste were included in Section 6.4.1. Because the Borrego Landfill is not subject to EPA MRR reporting, the waste-in-place at the Borrego Landfill through 2019 and IPCC first-order decay model were used to project emissions through 2050.

The Otay Landfill is required to report annual emissions at the landfill through the EPA MRR.[120] EPA MRR only provides a snapshot of the landfill emissions in a given year, but not projections. The change in emissions estimated using CARB LGT and IPCC first-order decay model was applied to the Otay MRR-reported 2019 emissions. Because Otay Landfill accepts waste from many jurisdictions in the San Diego region and is projected to close in 2028,[121] waste-in-place through 2028 was used in the landfill emissions projection.[122] The projected emissions from active landfills are shown in Table 64. The projected emissions peak around 2030 and then decrease through 2050, mostly due to the Otay Landfill closure in 2028.

Table 64 Projected Emissions from Active Landfills Though 2050

Year	Projected GHG Emissions (MT CO_2e)		
	Borrego Landfill	Otay Landfill	Total Active Landfills
2025	1,785	110,410	112,195
2030	1,615	119,519	121,133
2035	1,461	108,145	109,606
2040	1,322	97,854	99,176
2045	1,196	88,542	89,738
2050	1,082	80,116	81,198

Estimated closure year for Otay Landfill is 2028 based on EPA mandatory GHG reporting.
Energy Policy Initiatives Center, University of San Diego 2023

6.4.3 Projected Emissions from Out-of-Boundary Landfills

Out-of-boundary landfill emissions were forecasted using different scaling methods for different categories (Table 65). Electricity and natural gas use at out-of-boundary landfills was scaled to the anticipated County employee growth in 2030 through 2050. The CARB's LGT model was used to forecast emissions from landfills for which historical tonnage data was available. Historical tonnage data were readily available for the Encinitas, Palomar, and San Marcos. For other landfills, the rates of decay for these landfills were used to project emissions from the other out-of-boundary landfills owned and/or operated by the County. The emissions associated with the pilot light are not anticipated to change between 2019 and 2050 as this technology is not expected to advance in this timeframe. Flared gas emissions from County landfills were projected based on change in fugitive CH4 emissions from municipal landfills with landfill gas capture.

[120] EPA: Greenhouse Gas Reporting Program, Otay Landfill 2019 emissions data downloaded on April 16, 2021.
[121] EPA: Greenhouse Gas Reporting Program, Otay Landfill 2019 emissions data downloaded on April 16, 2021.
[122] CARB: Landfill Gas Tool (updated September 24, 2021). The 2021 version of the CARB Landfill Gas Tool only shows results through 2024. EPIC calculated the emissions through 2050 using the same methods and assumptions as the ones in the Tool, January 26, 2023. For post-2019 (2020-2028) annual waste disposal, an average of 2015-2019 (1,422,403 tons is used).

Table 65 Projected Emissions from Out-of-Boundary Landfills Though 2050

Year	Emissions from San Marcos Landfill (MT CO_2e)	Emissions from Poway Landfill (MT CO_2e)	Emissions from Palomar Landfill (MT CO_2e)	Emissions from Hillsborough Landfill (MT CO_2e)	Emissions from Gillespie Landfill (MT CO_2e)	Emissions from Encinitas Landfill (MT CO_2e)	Emissions from Bell Junior High Landfill (MT CO_2e)	Total Emissions from Out-of-Boundary Landfills (MT CO_2e)
2030	7,627	3,875	3,875	611	954	1,372	446	18,760
2035	6,907	3,508	3,508	566	863	1,242	404	16,998
2040	6,258	3,178	3,178	525	782	1,124	366	15,411
2045	5,667	2,877	2,877	488	707	1,018	331	13,965
2050	5,134	2,605	2,605	455	640	921	300	12,660
Ascent Environmental, 2023								

6.4.4 Total Projected Emissions from Waste

Total projected emissions from waste, calculated in Sections 6.4.1 and 6.4.2, are provided in Table 66.

Table 66 Projected GHG Emissions from Solid Waste Through 2050

Year	Emissions from County Waste Disposal (MT CO_2e)	Emissions from In-Boundary Landfills (MT CO_2e)	Community Emissions from Waste (MT CO_2e)	County Operations Emissions from Waste (MT CO_2e)	Total Emissions from Waste (MT CO_2e)
2025	75,250	116,928	192,000	--	192,000
2030	75,608	125,417	201,000	17,000	219,000
2035	75,965	113,482	189,000	17,000	206,000
2040	76,502	102,683	179,000	16,000	194,000
2045	77,039	92,911	170,000	14,000	184,000
2050	77,577	84,069	162,000	13,000	175,000
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation. 2025 Projections are not available for County operations. Energy Policy Initiatives Center, University of San Diego 2023					

6.5 Propane

Propane through 2050 was projected using the 2019 baseline propane use in residential and non-residential sectors, projected housing and employment growth. The forecast method for each sector is shown in Table 67.

Table 67 Forecast Method for Propane Use

Sector	Forecast Method
Residential	Single-family Housing Unit Growth
Commercial	Commercial Jobs Growth
Industrial	Industrial Jobs Growth
Agricultural	Agricultural Land Growth

The propane emission factor used for the 2019 baseline is fixed through 2050. The projected emissions from propane are provided in Table 68.[123]

Table 68 Projected GHG Emissions from Propane Use Through 2050

Year	Projected Propane Use (Million Gallons)					Emission Factor (kg CO_2e/ Gallon)	Community GHG Emissions (MT CO_2e)	County Operations Emissions (MT CO_2e)	Total Propane Emissions (MT CO_2e)
	Comm.	Indust.	Ag.	Res.	Total				
2025	1.2	0.1	1.0	19.2	21.5	5,819	125,000	--	125,000
2030	1.3	0.1	1.0	19.5	21.9	5,819	127,000	-	127,000
2035	1.4	0.1	1.0	19.7	22.2	5,819	129,000	-	129,000
2040	1.5	0.1	1.0	19.9	22.5	5,819	131,000	-	131,000
2045	1.6	0.1	1.0	20.0	22.7	5,819	132,000	-	132,000
2050	1.6	0.1	1.0	20.1	22.9	5,819	133,000	-	133,000

Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
2025 Projections are not available for County operations. County operational emissions are zero when rounding for purposes of combining operational and community-wide emissions.
Comm. = Commercial; Indust. = Industrial; Ag. = Agricultural; Res. = Residential
County of San Diego 2022, Energy Policy Initiatives Center, University of San Diego 2023

6.6 Off-road Transportation

For off-road transportation, San Diego regional off-road emissions were allocated to the County based on vehicle category-specific allocation factors discussed in Section 4.7. The projected emissions from off-road transportation are provided in Table 69.[124]

Table 69 Projected GHG Emissions from Off-Road Transportation Through 2050

Year	Projected GHG Emissions (MT CO_2e)									
	Lawn and Garden	Light Comm.	TRUs	Airport GSE	C&M	Indust.	RVs	Total Community ($MTCO_2e$)	County Operations ($MTCO_2e$)	Total Emissions ($MTCO_2e$)
2025	7,631	7,584	3,174	2,575	61,410	9,248	458	92,000	--	92,000
2030	7,697	7,811	3,133	2,746	67,738	8,962	493	99,000	100	99,000
2035	7,757	8,642	3,591	2,957	73,461	9,531	529	106,000	100	106,000
2040	7,841	9,146	3,964	3,203	75,849	9,732	567	110,000	100	110,000
2045	7,922	9,630	4,394	3,214	78,454	9,757	608	114,000	100	114,000
2050	8,043	10,189	4,893	3,239	81,571	9,853	647	118,000	100	118,000

Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
Light Comm. = Light Commercial; TRUs = Truck Refrigeration Units; Airport GSE = Airport Ground Support Equipment; C&M = Construction and Mining; RVs = Recreational Vehicles.
2025 Projections are not available for County operations.
CARB OFFROAD2021 v1.0.3, Energy Policy Initiatives Center, University of San Diego 2023

[123] Housing and employment growth are discussed in Section 2.4 Demographics.
[124] OFFROAD2021 v1.0.3 data were downloaded from CARB EMFAC database on August 23, 2022. Emissions in San Diego County (San Diego region) in CARB models were given in tons per day and converted to metric tons per year.

6.7 Agriculture

For emissions projections from agricultural equipment, San Diego regional agricultural equipment emissions from the OFFROAD2021 model projections were allocated to the county based on the ratio of county to region agricultural land acreage. CARB has embedded adopted regulations affecting off-road equipment emissions into the OFFROAD2021 model. For the sub-categories other than agricultural equipment, emissions were projected using the 2019 baseline emissions and projected agricultural land acreage in the county. The projected emissions from agriculture are provided in Table 70.[125] The projections for County operations emissions do not include any agricultural activities.

Table 70 Projected GHG Emissions from Agriculture Through 2050

Year	Agricultural Land (Acres)	Projected GHG Emissions (MT CO_2e)				
		Agricultural Equipment	Enteric Fermentation	Manure Management	Soil Management	Total
2025	114,746	63,269	28,645	26,798	12,244	131,000
2030	112,385	61,164	28,056	26,247	11,992	127,000
2035	110,023	59,214	27,466	25,695	11,740	124,000
2040	109,578	57,297	27,355	25,591	11,693	122,000
2045	109,132	55,515	27,244	25,487	11,645	120,000
2050	108,687	53,849	27,133	25,383	11,598	118,000

Agricultural land acreages in the unincorporated county do not include rural residential areas that may have small orchards or fields.
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
SANDAG, 2022, Energy Policy Initiatives Center, University of San Diego 2023

6.8 Water

The water supply projection through 2050 was based on the population growth in the county and the 2019 per capita water use within and outside the SDCWA service areas. The water sources – groundwater for areas not covered by SDCWA and a mix of imported and local supply for SDCWA member agencies shown in Table 39 – were assumed to be the same through 2050.

The upstream energy intensity, and local water and distribution energy intensity described in Section 4.8.3 were assumed to be the same through 2050. However, for the electricity used to supply, treat, and distribute the water, the suppliers of the electricity have to meet the RPS mandates as discussed in Section 6.2.1.1 to achieve 100% renewable or zero-carbon emissions by 2045. The projected emissions from water are provided in Table 71.

[125] The agricultural land acreage projection is based on SANDAG Series 14 Growth Forecast, provided by SANDAG to EPIC, August 31, 2022. In the SANDAG Land Use Codes, agriculture land includes orchards, or vineyards, intensive agriculture, and field crops.

Table 71 Projected GHG Emissions from Water Through 2050

Year	Water Supply (Acre-feet)		Water Supply (GWh)		Emission Factor (lb CO_2e/MWh)		Community GHG Emissions (MT CO_2e)	County Operations Emissions (MT CO_2e)	Total GHG Emissions (MT CO_2e)
	SDCWA Member Agencies	Groundwater Outside SDCWA Service Area	Upstream Electricity Use	Local Treatment-Distribution Electricity Use	Upstream (Statewide Average)	Local Grid Supply			
2025	84,714	7,365	165	22	407	489	35,000	--	35,000
2030	85,116	7,400	166	22	367	367	31,000	--	31,000
2035	85,518	7,435	166	22	92	92	8,000	--	8,000
2040	86,123	7,488	168	22	46	46	4,000	--	4,000
2045	86,728	7,540	169	22	-	-	-	--	--
2050	87,333	7,593	170	23	-	-	-	--	--

Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
2025 Projections are not available for County operations. County operational emissions are zero when rounding for purposes of combining operational and community-wide emissions.
Energy Policy Initiatives Center, University of San Diego 2023

6.9 Wastewater

The wastewater flow to centralized wastewater treatment plants with anaerobic digestion, and population served by wastewater treatment plants without anaerobic digestion and on-site septic systems, were projected through 2050 based on the population growth in the county and the 2019 wastewater flow and population. The wastewater emission factors at the WWTPs with anaerobic digestion, fugitive and process emission factors at WWTPs without anaerobic digestions, and emission factors of septic systems, described in Section 4.9.5 and Table 50 were assumed to be the same through 2050. The projected emissions from wastewater are provided in Table 72. The projections for County operations emissions do not include any emissions from wastewater treatment processes.

Table 72 Projected GHG Emissions from Wastewater Through 2050

Year	Wastewater Treated at WWTPs with Anaerobic Digestion		Wastewater Treated at WWTPs Without Anaerobic Digestion		Wastewater Disposed in Septic System		Community GHG Emissions (MT CO_2e)
	Flow (Million Gallons/ year)	GHG* Emissions (MT CO_2e)	Population**	GHG Emissions (MT CO_2e)	Population	GHG Emissions (MT CO_2e)	
2025	4,685	2,098	140,404	1,969	149,567	14,603	19,000
2030	4,708	2,108	141,070	1,978	150,277	14,673	19,000
2035	4,730	2,118	141,737	1,988	150,987	14,742	19,000
2040	4,763	2,133	142,739	2,002	152,055	14,846	19,000
2045	4,797	2,148	143,742	2,016	153,122	14,950	19,000
2050	4,830	2,163	144,744	2,030	154,190	15,055	19,000

*Emissions are calculated based on projected wastewater flow (based on population) to and emission factors at Point Loma Wastewater Treatment Plant, San Luis Rey Wastewater Treatment Plant, and Encina Water Pollution Control Facility.
**Population served by wastewater treatment plants with and without nitrification/denitrification processes
Projected GHG emissions for each category are rounded. Values are not rounded in the intermediate steps in the calculation.
Energy Policy Initiatives Center, University of San Diego 2023

Appendix A

County of San Diego Climate Action Plan Inventory Transportation Modeling Overview

FEHR PEERS

Memorandum

Date: October 18, 2023

To: Meghan Kelly, County of San Diego

From: Katy Cole, Fehr & Peers

Subject: County of San Diego Climate Action Plan Update Inventory Transportation Modeling Overview

SD21-0394

The purpose of this memorandum is to document the technical analysis tool that is used to estimate Vehicle Miles Traveled (VMT) within the County of San Deigo Climate Action Plan Update (CAP Update) inventory. Transportation engineers/planners commonly use analysis tools called a "travel demand models" to estimate VMT. In the San Diego region, the San Diego Association of Governments (SANDAG) maintains a regional travel demand model. SANDAG has several versions of the regional travel demand model; this memorandum describes the model versions, and which one is appropriate to use for the CAP Update Inventory.

At the onset of the technical analysis for the CAP Update, County staff had planned to contract with the SANDAG Service Bureau to perform county specific modeling; however, SANDAG was unable to perform the work due to workload constraints and limitations with the model. At the time, SANDAG did not have a version of the model that could be customized and was experiencing delays of over a 12-18 months in performing model runs for member agencies. Instead, County and Fehr & Peers staff identified other options, using SANDAG's available "off-the-shelf" travel demand model data. This memorandum describes the model versions available "off-the-shelf," considerations/characteristics for each option, and ultimately the most appropriate option to use for CAP Update purposes.

VMT is an important input included in the development of a new baseline greenhouse gas (GHG) emissions inventory and projections which identifies the amount of GHG emissions associated with travel activities within the unincorporated area. As described herein, the SANDAG ABM 2+[1] model using land use data set ("DS") 39 for base year (2016), 2035, and 2050 was used to determine the total VMT estimates for the CAP Update.

The SANDAG ABM 2+ is determined to be the best tool in the San Diego region for analyzing existing and future VMT at a regional scale. This memorandum documents the evidence for using the SANDAG ABM

[1] The SANDAG ABM 2+ model uses "Series 14" land use assumptions. The version of the model used to perform the CAP Update analysis is SANDAG Series 14.3.0, Data Set 39.

2+ model DS 39 version for the CAP Update GHG inventory and the basis for the SEIR VMT modeling. As a cross-reference, the "CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis" Memorandum (Fehr & Peers, April 2023) documents that the 2016 SANDAG base year reasonably reflects the 2019 baseline used for the GHG inventory. The "CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis" documents that the number of residential dwelling units included in the 2016 SANDAG base year matches within a less then one-percent difference, the County's housing portal data through 2019. The County uses the housing portal to track construction of dwelling units and the number of units within the unincorporated area. Therefore, based on the comparison of the ABM 2+ 2016 dwelling units to the County housing portal data, the differences between the model data and County data are acceptable for the purposes of countywide VMT and GHG modeling (less than one-percent difference). The SANDAG ABM 2+ Model (Series 14.3.0) year 2016 is an appropriate tool to use to estimate VMT for the unincorporated county for 2019 conditions.

Selecting a Transportation Modeling Scenario for the CAP VMT Analysis

Background on the SANDAG Model

SANDAG builds and maintains a regional travel demand model that is used to forecast transportation metrics within the region. These metrics are in turn used by jurisdictions as consistent inputs for the evaluation of programs, plans, and projects. Travel demand models use input data such as land uses (population/employment) for each of the jurisdictions in the county, roadway and transportation network data, and socioeconomic information to understand existing and future travel behavior. The SANDAG model includes information for the entire San Diego County area, including the unincorporated area. The model is validated and calibrated to "base year" to represent regional existing conditions. As described above, a comparison of the residential dwelling units from the County's housing portal and the SANDAG ABM2+ model 2016 base year revealed that the SANDAG 2016 base year reasonably represents the residential land use in the unincorporated area in 2019.

The SANDAG travel demand model is a complex and robust tool that runs on a specific travel model software called "Emme 2" that requires specialized expertise in travel demand forecasting and significant computer processing power. The model cannot run on a standard computer, and it takes several days to completely run.

The SANDAG Model goes through major version changes every time a new SANDAG Regional Plan is adopted. The most recent version change is to the "Activity Based Model 2+" (ABM2+), which is the model that includes a scenario for the December 2021 SANDAG Regional Plan/Sustainable Community Strategy (SCS). As part of the development of the 2021 Regional Plan, SANDAG modeled several different scenarios using the ABM2+ model. SANDAG's model produces many outputs for each scenario, including the amount of daily VMT in the region; the daily regional VMT output can be processed to produce daily VMT for each local jurisdiction in the region, including the unincorporated area. The method used to determine the unincorporated area's allocation of daily VMT in the San Diego region is described later in this memorandum.

Each scenario includes different land use and regional growth forecast assumptions developed by SANDAG regarding the location and amount of future residential and non-residential growth in the region, the location and type of future transportation investments that would be made in the region (e.g., highway improvements, public transit infrastructure and operations) and assumptions about future transportation policies and behaviors that would be in place in the region (e.g., road usage charge, the costs of owning and operating a vehicle, the rate of teleworking by employees).

The land use and growth assumptions of the SANDAG model scenarios are available for the entire region and for each local jurisdiction, including the unincorporated area. SANDAG refers to the different land use and regional growth scenarios as "data sets" and assigns each data set an identification number for reference purposes. The 2021 Regional Plan model scenario land use assumption is referred to as Data Set (DS) 38 and the Regional Plan EIR Alternative 2 ("no build") scenario land use assumption is referred to as Data Set (DS) 39[2].

Model Scenarios

Fehr & Peers performed a detailed review of the SANDAG model assumptions in the scenarios modeled as part of the SANDAG 2021 Regional Plan (land use, transportation network, and policy) to identify the best available option for estimating baseline and future VMT in the unincorporated area for purposes of the CAP Update. The review determined which scenario has land use, transportation network, and transportation policy assumptions that align most closely with the County's 2011 General Plan, as amended (General Plan) and CAP Update baseline conditions. To determine the modeling scenario that aligns most closely with the County's General Plan we reviewed land use and growth assumptions that reflect reasonably foreseeable growth that is consistent with the General Plan (since the purpose of the CAP is to address GHG emissions resulting from the existing and future development associated with the General Plan) and existing and reasonably foreseeable transportation policies.

Fehr & Peers reviewed land use assumptions as summarized below. This information was used, in conjunction with other transportation and policy considerations, to determine the modeling scenario most appropriate for estimating VMT for the CAP Update. The following provides a summary of the land use assumptions from the SANDAG model versions and County sources:

- DS 38 SANDAG Model Growth between 2016 and 2035[3] = approximately 6,500 housing units
- DS 38 SANDAG Model Growth between 2016 and 2050[4] = approximately 7,900 housing units
- DS 39 SANDAG Model Growth between 2016 and 2035 = approximately 11,400 housing units

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[2] The residential land use growth quantities provided in this memo include growth in the unincorporated area, excluding military and tribal land.

[3] Note that the SANDAG Model Base Year is 2016 and the CAP Baseline inventory year is 2019. Fehr & Peers documented that the SANDAG 2016 Base Year housing assumptions for the unincorporated area is approximately equal to the number of housing units in 2019; therefore, VMT data from the SANDAG Model Base Year (2016) can be used to directly estimate the VMT for the CAP baseline inventory. (*CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis Technical Memorandum, April 2023).* The CAP horizon year is 2045 and the SANDAG Regional Plan horizon year is 2050.

[4] The CAP horizon year is 2045 and the SANDAG Regional Plan horizon year is 2050.

- DS 38 SANDAG Model Growth between 2016 and 2035[5] = approximately 6,500 housing units
- DS 38 SANDAG Model Growth between 2016 and 2050[6] = approximately 7,900 housing units
- DS 39 SANDAG Model Growth between 2016 and 2035 = approximately 11,400 housing units
- DS 39 SANDAG Model Growth between 2016 and 2050 = approximately 15,300 housing units
- "Population, Employment, and Housing Projections 2020-2050 Report" (AECOM, October 2023) (AECOM Study) Growth between 2020-2035 = approximately 8,000-14,940 housing units
- AECOM Study Growth between 2020-2050 = approximately 12,250 – 23,000 housing units
- The County's General Plan has theoretical capacity for approximately 60,000 additional residential units; however, historical growth and research suggests that this capacity won't be achieved within the CAP Update horizon year. Based on the General Plan capacity, the AECOM study, and historical growth trends it is expected that growth in the unincorporated area will range between 6,700 units (the 2029 Regional Housing Needs Assessment "RHNA" allocation for the County) and approximately 15,000 units between 2019 and 2050. The SANDAG Data Set 39 is consistent with these forecasts and has reasonable growth rates between the forecast years.

Three model options were considered as VMT data sources for the CAP Update as described:

Option 1: Utilize Model Output from the SANDAG 2021 Regional Plan Sustainable Communities Strategy (2021 Regional Plan/SCS, DS 38) – This option was considered because it aligns with the adopted SANDAG 2021 Regional Plan and reflects SANDAG's vision for regional transportation conditions. However, the 2021 Regional Plan assumes less housing in the unincorporated area than could be developed under the adopted General Plan and less than predicted by the AECOM study. The SANDAG 2021 Regional Plan assumes approximately 7,900 additional units through 2050 (with most being constructed between the model base year (2016) and 2035) whereas the General Plan buildout capacity is approximately 60,000 units and the AECOM Study estimates approximately 12,250 – 23,000 units.

Also, the 2021 Regional Plan/SCS version of the model includes the Road User Charge as a funding source for the Regional Plan. The Road User Charge directly affects auto operating costs; including the Road User Charge results in lower VMT forecasts than scenarios without the Road User Charge. On September 23, 2022 the SANDAG Board directed SANDAG staff to prepare an amendment to the 2021 Regional Plan without the Road User Charge. The amendment is expected to be brought to the SANDAG Board of Directors for consideration on October 27, 2023 and is expected to move forward with removal of the Road User Charge. In addition, the SANDAG Board voted on September 22, 2023 against including the Road User Charge in the in-progress 2025 Regional Plan. The 2021 Regional Plan includes other policy

[5] Note that the SANDAG Model Base Year is 2016 and the CAP Baseline inventory year is 2019. Fehr & Peers documented that the SANDAG 2016 Base Year housing assumptions for the unincorporated area is approximately equal to the number of housing units in 2019; therefore, VMT data from the SANDAG Model Base Year (2016) can be used to directly estimate the VMT for the CAP baseline inventory. (*CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis Technical Memorandum, April 2023).* The CAP horizon year is 2045 and the SANDAG Regional Plan horizon year is 2050.

[6] The CAP horizon year is 2045 and the SANDAG Regional Plan horizon year is 2050.

and transportation network assumptions beyond the Road User Charge that further result in lower VMT, many of these assumptions rely upon public vote, funding, or SANDAG Board actions that are speculative.

Therefore, this scenario was dismissed because it does not represent reasonably foreseeable land use, transportation policy/network, and VMT under the County's adopted General Plan. Using this option would result in less VMT than predicted by the other options and less VMT than reasonably foreseeable.

Option 2: Utilize VMT Output from the 2021 Regional Plan EIR Alternative 2 (DS 39) – This option was considered because the land use, transportation network, and policy assumptions included in this model version aligned well with growth assumptions and reasonably foreseeable transportation network and policy expectations. The AECOM study suggests residential unit growth between 2020-2050 to be approximately 12,250 – 23,000 units. The housing growth assumed in the DS 39 model is approximately 15,300 between the model base year (2016) and 2050. In addition, the future transportation network assumptions in DS 39 are based on the 2019 Federal Regional Transportation Plan funded improvements, which are "transportation projects likely to be implemented if the proposed Plan [SANDAG 2021 Regional Plan] were not adopted. These consist of transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans…"(SANDAG 2021 Regional Plan EIR, Chapter 6 Alternatives Analysis, Page 6-3).

This scenario was selected, as described in more detail below, because it assumes land use growth similar to the unincorporated growth expectations and importantly includes roadway network and policy assumptions that are not speculative.

Option 3: Combine Outputs, Using DS 38 for 2035 Data and DS 39 from 2050 Data – This option was considered because the residential land use growth trend aligns well with county expectations using DS 38 (SANDAG Regional Plan) for the model base year 2016 through 2035 but also allows consideration for more growth beyond 2035. For comparison purposes, the AECOM study suggests that approximately 8,000 – 14,940 residential units would be constructed between 2020-2035 and the DS 38 includes 6,500 residential units. Also, the AECOM study and the land use assumptions in DS 39 both suggest additional residential growth beyond 2035, whereas DS 38 has limited growth beyond 2035.

A shortcoming of this option is that there are major differences in the transportation network and policy assumptions between DS 38 and DS 39. DS 38 does not include the Road User Charge or major transportation investments beyond those that are likely to be implemented (demonstrated by having funding, environmental clearance, or are under construction).

Explained a different way, if all land use was held constant between DS 38 and DS 39, DS 38 would still result in less VMT than DS 39 attributed to the transportation network and policy assumptions (such as the Road User Charge).

Therefore, VMT results from the two models are not comparable and using one model version for one horizon year and one model version for a different horizon year is not appropriate. Therefore, this option was dismissed.

Table 1 below provides a comparison of the scenarios that were considered.

Table 1: SANDAG Model Scenarios Considered for the CAP Inventory and Projections

Option	Land Use and Growth Summary	Transportation Network Summary	Model Policy/Other Model Inputs[1]	Notes on Alignment with County General Plan
1. Utilize VMT Output Data from the 2021 Regional Plan/SCS	Uses Data Set 38: For the unincorporated area the housing growth is: • 2016-2035: 6,500 units • 2016-2050: 7,900 units	2021 Regional Plan Network (major investment/5 Big Moves)	• Includes road user charge. • Includes modest teleworking assumptions growing over time. • Auto Operating Costs = $0.2	The adopted 2021 Regional Plan has land use assumptions that are not consistent with the County General Plan, do not match historical housing growth trends and does not align with the AECOM study for expected land use growth. Additionally, the Regional Plan version of the model includes the Road User Charge as a funding source for the plan. The Road User Charge directly affects the auto operating cost; including the Road User Charge results in lower VMT forecasts than scenarios without the Road User Charge. On September 23, 2022, the SANDAG Board directed SANDAG staff to prepare an amendment to the 2021 Regional Plan without the Road User Charge. The amendment is expected to be brought to the SANDAG Board of Directors for consideration on October 27, 2023. In addition, the SANDAG Board voted on September 22, 2023 against including the Road User Charge in the in process 2025 Regional Plan. Since the land use is not reasonably foreseeable per the General Plan (there is no growth assumed beyond 2035) and the scenario includes the Road User Charge, this option was not selected for use in the CAP update because it would have resulted in less VMT for the unincorporated area than what would be reasonably foreseeable.

2. Utilize VMT Outputs from the 2021 Regional Plan EIR Alternative 2	**Uses Data Set 39: For the unincorporated area the housing growth is:** • **2016-2035: 11,400 units** • **2016-2050: 15,300 units**	**2019 Federal Regional Transportation Plan Network (near term investments in regional roadways and transit)**	• **Does not include the road user charge.** • **Includes modest teleworking assumptions growing over time.** • **Auto Operating Costs = $0.174**	**The land use assumptions contained in Data Set 39 are consistent with historical growth patterns in the unincorporated area and reflect reasonably foreseeable growth as demonstrated by the AECOM study that shows land use growth in the unincorporated area (12,250 – 23,000 units through 2050). Additionally, the modest transportation network and policy inputs included in this model are not speculative and include projects that are likely to be constructed that have funding, environmental clearance, or are currently being constructed. The result is higher VMT/GHG than the 2021 Regional Plan/SCS scenario. Choosing this data source results in more future VMT than choosing DS 38 resulting in greater GHG reduction strategies in the CAP .This option was utilized to estimate VMT for the CAP Update inventory.**
3. Utilize VMT Outputs from Combination of Off-the Shelf Regional Plan EIR Alt. 2 and Off-the Shelf Regional Plan	Use DS 38 for 2035 model year and DS 39 for 2050. For the unincorporated area the housing growth is: • 2016-2035: 6,500 units • 2016-2050: 15,300 units	See above, would mix assumptions	See above, would mix assumptions	Using data from two separate scenarios is problematic because of the difference in policy assumptions and transportation network assumptions. Both the policy assumptions and transportation network assumptions influence travel behavior and VMT. If land use is held constant in the travel demand model, scenarios run with different policy and transportation network assumptions would result in completely different VMT results. Therefore, the VMT resulting from scenarios with differing policy and transportation network assumptions are not comparable. It is not appropriate to use one set of assumptions for one forecast year and an alternate set of assumptions for a later forecast year unless it is reasonably foreseeable that the policy and/or transportation network assumptions would actually change between the model years. Since it is not reasonably foreseeable that the policy and network differences between the model scenarios would be different for different years, this option was not selected for use in the CAP update.

Notes: [1] Auto Operating Costs affect VMT, lower auto operating costs result in higher VMT (because it is less expensive to drive).
Source: Fehr & Peers, 2023

Reasons for Using the Regional Plan EIR Alternative 2 (Data Set 39) Model Scenario

Ultimately, as identified in Table 1, Option 2, the Regional Plan EIR Alternative 2 (DS 39) Model Scenario was selected as the best option to forecast existing and projected VMT in the CAP Update. Use of this model scenario offers the most accurate projections of VMT across the CAP Update timeline horizon because:

- The total housing growth in Data Set 39 is comparable to County forecasts based on historical growth, market expectations, and General Plan capacity.
- The future transportation network assumptions in DS 39 are based on the 2019 Federal Regional Transportation Plan funded improvements, which are "transportation projects likely to be implemented if the proposed Plan [SANDAG 2021 Regional Plan] were not adopted. These consist of transportation projects with environmental clearance, that have full funding, are under construction, or are otherwise reasonably foreseeable based on current plans…"(SANDAG 2021 Regional Plan EIR, Chapter 6 Alternatives Analysis, Page 6-3). Use of these assumptions provides more certainty than use of the 2021 Regional Plan/SCS scenario which includes major roadway and transit network investments that may not be implemented because identified funding sources are not guaranteed, for example funding generated by future fees/tax initiatives such as the Road User Charge.
- Use of the Regional Plan EIR Alternative 2 (Data Set 39) Model Scenario is also a more conservative estimate of VMT because of the transportation network assumptions which result in a higher amount of VMT being generated because it assumes fewer transportation network investments that would reduce VMT (such as regional transit/active transportation projects) and assumes a lower auto operating cost as compared to the 2021 Regional Plan. These assumptions result in more driving (because it is cheaper to drive) and less alternative mode use (because there are not high levels of investments directed at expanding the transit/bicycle/pedestrian network), resulting in higher VMT.
- The Road User Charge isn't included as a funding source. As noted, the SANDAG Board has directed removal of the Road User Charge and is not including it in the in progress 2025 Regional Plan.
- The modeling was performed by SANDAG and is well documented in the Regional Plan EIR. It reflects the latest modeling software that SANDAG is using (EMME using ABM2+).

Methodology for Determining Total VMT

Fehr & Peers utilized the Regional Plan EIR Alternative 2 (Data Set 39) Model Scenario output to determine VMT for the unincorporated area for use in the CAP Update inventory and projections. Total VMT and transportation metrics were evaluated for baseline 2019 and future 2035 and 2050 conditions using the "CAP" method[7] as follows:

[7] "The "CAP" method for estimating total VMT is used throughout California and is the ICLEI (ICLEI-Local Governments for Sustainability) recommended methodology. In addition, it is documented in the SANDAG Regional Climate Action Planning Framework (ReCAP), December 2020, Appendix I, Pages 18-21.

- Total VMT produced using the "CAP" method includes all internal VMT, ½ of internal to external VMT, and ½ of external to internal VMT. For example, all VMT originating from trips that start and end in the unincorporated area are included. One half of the VMT that originates in the unincorporated area but ends in one of the region's cities is included AND one half of the VMT that originates in one of the cities but ends in the unincorporated area is included. This also includes VMT associated with trips that start/end outside of the SANDAG model boundary (for example Riverside County) but are destined for/originate in the unincorporated area. These trips are treated the same as "XI" or "IX" trips.

Total VMT Generated (CAP)	All vehicle-trips are traced to the zone or zones of study. This includes internal to internal (II), 1/2 internal to external (IX), and 1/2 external to internal (XI) trips. May use final assignment origin-destination (OD) trip tables or production (P) and attraction (A) estimates multiplied by distance skims. When the model has multiple assignment periods, OD trip tables and congested skims from each period should be used.	

In addition, adjustments were made to account for military and tribal land, which is not within the County's land use jurisdiction. The *Military and Tribal VMT Adjustment for the San Diego County CAP Model Scenarios* (Fehr & Peers, February 2023) describes the process for the adjustment.

Conclusion

The Regional Plan EIR Alternative 2 (Data Set 39) Model Scenario was used as the basis for the CAP Update inventory. The Regional Plan EIR Alternative 2 (Data Set 39) Model Scenario represents existing conditions (2019 for the CAP Update inventory) and reasonably foreseeable growth through 2035 and 2050. Total VMT for the CAP Update inventory, using the "CAP" method[8], was determined from the model and adjustments were made to properly account for military and tribal lands.

[8] "The "CAP" method for estimating total VMT is used throughout California and is the ICLEI (ICLEI-Local Governments for Sustainability) recommended methodology. In addition, it is documented in the SANDAG Regional Climate Action Planning Framework (ReCAP), December 2020, Appendix I, Pages 18-21.

Appendix B

Climate Action Plan Update - Population, Housing, and Employment Market Capacity Study for the Unincorporated Area

County of San Diego

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October 12, 2023

CLIMATE ACTION PLAN UPDATE – POPULATION, HOUSING, AND EMPLOYMENT MARKET CAPACITY STUDY FOR THE UNINCORPORATED AREA

The primary objective of the County of San Diego (County) Climate Action Plan Update (CAP Update) is to reduce greenhouse gas (GHG) emissions generated from activities within the unincorporated county (community) and emissions generated by operating County facilities, including facilities and operations located within incorporated cities (County operations). As part of the CAP Update, both County operations and community GHG emissions inventories and projections are being updated. This memorandum describes the County's approach to developing GHG emissions projections for the CAP Update.

Climate Action Plan Background

On August 3, 2011 (1), the County Board of Supervisors (Board) approved a comprehensive General Plan Update. The Final Program Environmental Impact Report (Program EIR) prepared in support of the General Plan Update identified contributions to climate change as a potentially significant environmental impact. The General Plan Update made modifications to the County's land use through changes to the future development of the County by locating 80 percent of the future dwelling unit capacity toward the western third of the unincorporated areas, within the County Water Authority boundary, and reducing the overall development capacity by 15 percent.

While the General Plan Update focused development within the Village Core areas away from rural areas, the Program EIR still studied and proposed mitigation for the environmental impacts from future development allowed in all areas of unincorporated county reflected in the General Plan Update. Consequently, 19 separate mitigation measures were adopted to reduce the GHG emissions from activities within the unincorporated county, and County operations, to below a level of significance. One of the 19 measures, designated CC 1.2, called for the preparation of a Climate Action Plan (CAP). CC 1.2 reads: "Prepare a County Climate Change Action Plan with an update[d] baseline inventory of greenhouse gas emissions from all sources, more detailed greenhouse gas emissions reduction targets and deadlines, and comprehensive and enforceable [greenhouse gas] emissions reduction measures that will achieve a 17% reduction in emissions from County operations from 2006 by 2020 and a 9% reduction in community emissions between 2006 and 2020. Once prepared, implementation of this plan will be monitored and progress reported on a regular basis." CC 1.2 was incorporated into the General Plan Update as Goal Conservation and Open Space (COS) 20 and Policy COS 20.1.

The County prepared and adopted a CAP and related environmental coverage on June 20, 2012 (4), which was subsequently challenged and found by the Appellate Court to be in violation of the California Environmental Quality Act (CEQA) and was rescinded by the Board on April 8, 2015 (3). A new CAP (2018 CAP) and related environmental coverage was prepared and adopted on February 14, 2018 (1). The 2018 CAP was challenged and invalidated in court. The Court ordered that the County prepare a new CAP and Supplemental EIR. As a result, the 2018 CAP was rescinded on September 30, 2020 (4) and on December 10, 2020, the County sent public notice that a CAP Update and Supplemental EIR will be prepared.

On January 13, 2021 (5), the Board approved new policy recommendations to guide the preparation of a CAP Update. The recommendations direct the Chief Administrative Officer to:

1. "Develop a Climate Action Plan for the County that is:
    a. comprehensive and legally enforceable;
    b. does not rely on the purchase of carbon offsets to meet emission reduction targets;
    c. uses updated data and modeling;
    d. sets clear goals and measurable metrics that show how we are ensuring environmental justice and equity;
    e. is shaped by community input; and
    f. will meet and exceed Senate Bill 32 GHG emissions reductions of 40% below the 1990 level by 2030 and establish actions to meet a goal of net zero carbon emissions by 2035-2045 (in line with Executive Order B-55-18)."
2. Conduct stakeholder engagement, hold public hearings, and undertake environmental review; and
3. Report back to the Board bi-monthly with progress.

Climate Action Plan Update Greenhouse Gas Emissions Inventory and Projections

The CAP Update is a mitigation measure for GHG emissions associated with existing and new development anticipated to occur as a result of build out under the County's General

Plan. A primary component of the CAP Update is the GHG emissions inventory which provides an estimate of GHG emissions that can be readily estimated, monitored, and reduced by County actions outlined in CAP measures (CAP Measures) that are within the County's jurisdictional influence. With the GHG emissions inventory in place, the CAP Update projects emissions through 2050 based on anticipated growth in the unincorporated county and the future impact of adopted federal and State regulations, policies, and programs in place during CAP Update development. Using these projections, GHG emissions reduction targets are established to identify the emissions levels needed to reach State legislative targets and Board direction.

To develop GHG emissions projections for the unincorporated area, population, housing, and job growth must be established to estimate future GHG emissions levels through 2050. As part of CAP Update development, the County hired a consultant, AECOM, to evaluate historic market trends since 2011 General Plan Update (General Plan) adoption and establish anticipated population, housing, and job growth based on these trends (Attachment A). In addition, the County hired a consultant, California Economic Forecast, to perform a peer review of the AECOM report and determine whether AECOM's findings adequately reflected historic and anticipated market trends for the unincorporated area (Attachment B). This approach would develop substantial evidence for anticipated population, housing, and job growth to be considered when establishing GHG projections through 2050 for the CAP Update. While some factors included in the attached reports, such as anticipated units included in Specific Plan areas, may have changed since the time of writing (2022), the analyses remain reflective of market conditions and provide a conservative estimate of anticipated population, housing, and job growth in the unincorporated area. By using a conservative estimate of growth (i.e., higher levels of growth) in the CAP Update GHG projections, the CAP would adequately mitigate for GHG emissions associated with new development anticipated to occur under the County's General Plan because higher growth forecasts result in greater GHG emissions reductions required to be mitigated through implementation of CAP Measures.

Climate Action Plan Update Greenhouse Gas Mitigation for General Plan Implementation

As detailed in the attached reports, historic market conditions determined that, through 2050, unincorporated area population, housing, and job growth would result in less growth than what is allowed under the County's General Plan. By using these reasonably foreseeable anticipated growth projections in the CAP Update GHG emissions projections, the CAP Update will mitigate emissions for growth expected to occur by 2050 based upon market conditions rather than what is allowed under full build out of the General Plan. Using growth projections that reflect market conditions which are lower than General Plan growth capacity will result in a realistic estimate of future GHG emissions that would need to be mitigated through implementation of CAP Measures. If the County were to use growth projections based on General Plan growth capacity, greater GHG emissions reductions would need to be achieved through CAP Measure implementation, which could result in increased costs to the County, residents, and businesses in the unincorporated area.

As the CAP Update is implemented, the County will use its existing Housing Production and Capacity Portal (Portal) to monitor General Plan build out. The Portal tracks progress towards implementing the General Plan by illustrating housing production and land use capacity since 2011. The Portal uses building permit data, adjustments to General Plan land use capacity, and other land use information to determine remaining growth capacity of the General Plan on a quarterly basis. The Portal provides information on how much and where development is occurring and where there is General Plan development capacity remaining. The County will use the Portal to track development assumed within the CAP Update and this market study. If the actual build out of the General Plan reaches the market-based growth estimates used in the CAP Update GHG emissions projections, the County would evaluate options for updating how development projects analyze GHG emissions during CEQA review. The County may also update the CAP to reflect these changed conditions.

Information on the Portal, including number of dwelling units since 2011, number of dwelling units receiving discretionary approval since 2011, capacity remaining, as well as other tools and information can be found at the following link: https://www.sandiegocounty.gov/content/sdc/pds/HPCP-UA/HPCP-IT.html.

Attachments:
Attachment B1 – AECOM Report: “Population, Employment, and Housing Projections 2020-2050”
Attachment B2 - California Economic Forecast Report: “Peer Review of the Population, Employment, and Housing Projections 2020-2050”

Appendix B

Attachment B1

AECOM

Population, Employment, and Housing Projections 2020-2050

Unincorporated San Diego County
Draft Revised Final Report

County of San Diego / Planning & Development Services

October 2, 2023

Delivering a better world

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GENERAL AND LIMITING CONDITIONS

AECOM devoted effort consistent with (i) the level of diligence ordinarily exercised by competent professionals practicing in the area under the same or similar circumstances, and (ii) the time and budget available for its work to ensure that the data contained in this report is accurate as of the date of its preparation. This study is based on estimates, assumptions, and other information developed by AECOM from its independent research effort, general knowledge of the industry, and information provided by and consultations with the Client and the Client's representatives. No responsibility is assumed for inaccuracies in reporting by the Client, the Client's agents and representatives, or any third-party data source used in preparing or presenting this study. AECOM assumes no duty to update the information contained herein unless it is separately retained to do so pursuant to a written agreement signed by AECOM and the Client.

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This document may include "forward-looking statements." These statements relate to AECOM's expectations, beliefs, intentions, or strategies regarding the future. These statements may be identified by the use of words like "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "project," "will," "should," "seek," and similar expressions. The forward-looking statements reflect AECOM's views and assumptions with respect to future events as of the date of this study and are subject to future economic conditions and other risks and uncertainties. Actual and future results and trends could differ materially from those set forth in such statements due to various factors, including, without limitation, those discussed in this study. These factors are beyond AECOM's ability to control or predict. Accordingly, AECOM makes no warranty or representation that any of the projected values or results contained in this study will actually be achieved.

This study is qualified in its entirety by, and should be considered in light of, these limitations, conditions, and considerations.

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Figures

Tables

1. Overview

The County of San Diego is seeking projections for population growth, housing growth, and employment growth in the unincorporated area. The projections will be used to estimate green house gas (GHG) emissions inventory and projections and support preparation of a Final Supplemental Environmental Impact Report (SEIR) for the County's Climate Action Plan (CAP).

As part of the preparation of the CAP update project, the County engaged AECOM in 2021 to prepare population, housing, and employment projections, which cover the period between 2020 and 2050. The projections are intended to reflect a realistic, market-based understanding of future growth. Based on historic and projected demographic trends and shifting market conditions, it is uncertain that the unincorporated areas of the county will ever reach full buildout of the capacity estimated in the General Plan.

The projections include two separate sets: a Base growth estimate and a High growth estimate. The Base growth estimate is driven by expected county-wide population growth, and the High growth estimate expands on the Base growth estimate by assuming absorption of all[1] qualified remaining entitled but unbuilt Specific Plan Area (SPA) units[2]. The projections are organized by geographical area, time period, and residential density category, as shown in Table 1.

Table 1. Organization of Data in Projections

Geography	Unincorporated San Diego County by Community Planning Area (24 total)
Categories	Population, Residential Units, Employment
Time Period	2020 to 2050 in five-year increments
Residential Type[3,4]	1. **Low-density**: below 2 units per acre (equivalent to County land use designation VR-2) 2. **Medium-low density**: between 2 and 7.3 units per acre (County land use designations VR 2, VR 7.3) 3. **Medium-high density**: between 7.3 and 15 units per acre, (County land use designations VR 7.3, VR 15) 4. **High-density**: between 15 and 30 units per acre (County land use designations VR 15, VR 30) 5. **Specific Plan Area (SPA)[5]**: including units in approved (or entitled) General Plan Amendment (GPA) projects in SPAs

The following report is organized into seven sections:

1. Overview
2. Considerations
3. Summary
4. Population Projections
5. Residential Projections
6. Employment Projections
7. Appendix

[1] The inventory of unbuilt SPA units represents total unbuilt units less units deemed unlikely to be developed, as discussed in Chapter 5 in the Marketable Site Supply section.
[2] In this report, "SPA" units refer to units entitled through both Specific Plan Areas and General Plan Amendments (GPAs). Both SPA- and GPA-initiated units, once adopted, are identified by the "SPA" land use designation. Historically, SPAs have been a major source of housing production in the unincorporated county.
[3] The residential density tiers were defined in consultation with County Staff to facilitate VMT analysis.
[4] Accessory Dwelling Units (ADUs) are not counted separately from the density categories of which they are a part. For more on how ADUs are treated by the projections, see the section below titled A Note on ADUs.
[5] SPA unit projections are separate from the other density categories. However, SPAs typically feature units at a wide range of densities.

2. Considerations

The following analysis uses available data largely collected in 2021 and early 2022 regarding historical trends, future growth projections, and current infrastructure and regulatory capacity to make forward-looking estimates. The estimates are subject to future economic conditions and other risks and uncertainties, and actual and future results and trends could differ materially from those set forth here due to factors that are beyond AECOM's ability to control or predict.

Some factors that could influence the volume, timing, and direction of future growth in the unincorporated area include the following:

- **Future Housing Policy**. The County is developing other policies related to housing development that could influence future growth. The projections contained in this report do not reflect any of these proposed initiatives that would incentivize or disincentivize future housing growth.
- **Environmental Risks.** Restrictions on development due to environmentally sensitive areas or court rulings could also impact the quantity and type of future housing development. The projections contained in this report do not reflect restrictions or rulings of this nature that would likely reduce the supply of developable sites.
- **Long-Term Market Impact of COVID-19 on commercial real estate.** The short-term spike of telework and e-commerce during the pandemic may have long-term and permanent impact on commercial and residential real estate. Recent studies have shown a short-term shift in housing demand away from neighborhoods with high population density because—it's theorized—the location benefits of compact development declined during the pandemic. The extent and permanence of this phenomenon is yet to be determined, as is its elasticity with respect to pricing and density and applicability to the 24 Community Planning Areas (CPAs) in the unincorporated county area.

3. Summary

Population Projections

Population for the unincorporated area between 2020 and 2050 is estimated to grow by 34,829 in the Base estimate for a total increase of 6.9% at an average annual growth rate of 0.22%. For the High estimate, population is estimated to grow by 63,695 for total increase of 12.6% at an annual growth rate of 0.40%. For further discussion of these projections, see Chapter 4 Population Projections.

Table 2. Population Growth Projections 2020-2050 Summary

Item	2020	2050	2020-50 # Change	2020-50 % Change	2020-50 Annual Growth Rate
Base Growth Estimate	505,675	540,504	34,829	6.89%	0.22%
High Growth Estimate	505,675	569,370	63,695	12.60%	0.40%

Source: AECOM

Housing Unit Projections

Housing unit inventory for the unincorporated areas between 2020 and 2050 is estimated to grow by 12,239 in the Base estimate for a total increase of 6.9% at an average annual growth rate of 0.22%. In the High estimate, inventory is estimated to grow by 23,431 units for a total increase of 13% and an annual growth rate of 0.42%. All additional growth in the High estimate relative to the Base estimate comes from growth of Specific Plan Area (SPA) units. In the Base estimate, SPAs are estimated to contribute 4,699 units and in the High estimate 15,459 units. For further discussion of these projections, see the Housing Unit Projections section below.

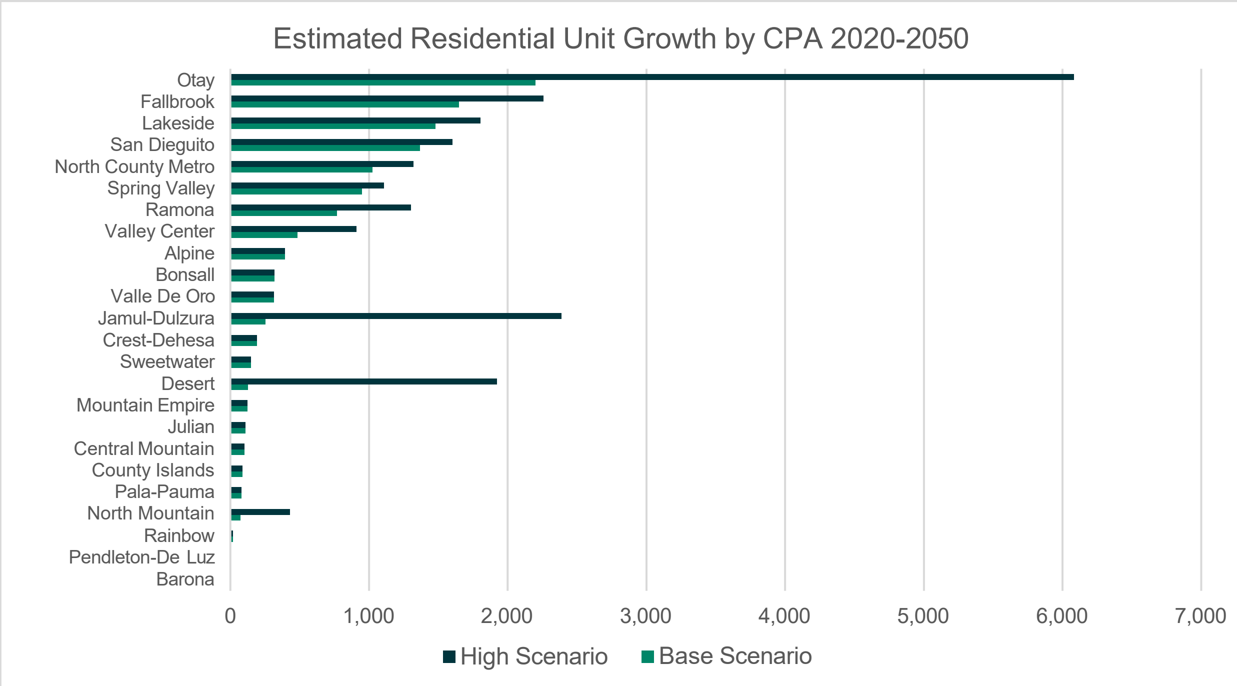
Table 3. Housing Growth Projections 2020-2050 Summary

Item	2020	2050	2020-50 # Change	2020-50 % Change	2020-50 Annual Growth Rate
Base Growth Estimate					
Total	176,610	188,849	12,239	6.9%	0.22%
Low Density	78,604	82,999	4,395	5.6%	0.18%
Medium Low Density	37,209	38,696	1,487	4.0%	0.13%
Medium High Density	16,089	17,138	1,049	6.5%	0.21%
High Density	15,189	15,798	609	4.0%	0.13%
SPA	29,520	34,219	4,699	15.9%	0.49%
High Growth Estimate					
Total	176,610	200,041	23,431	13%	0.42%
Low Density	78,604	83,413	4,809	6%	0.20%
Medium Low Density	37,209	38,964	1,755	5%	0.15%
Medium High Density	16,089	16,699	610	4%	0.12%
High Density	15,189	15,987	798	5%	0.17%
SPA	29,520	44,979	15,459	52%	1.41%

Source: AECOM

Estimated unit growth is distributed widely by CPA. In the Base estimate, Otay and Fallbrook are the largest contributors to unincorporated county growth. In the High estimate, Otay and its large inventory of planned unbuilt SPA units is the largest contributor by a significant margin. Other CPAs that contribute significantly more SPA growth in the High estimate include Jamul-Dulzura and Desert. The top-10 CPAs by growth in the Base estimate (from Otay to Bonsall, as shown in Figure 1) contribute 10,622 units between 2020 and 2050, equivalent to 87% of total forecast growth.

Figure 1: Residential Unit Growth Ranked by CPA 2020-2050: Base and High Growth Estimates



Source: AECOM

Residential growth is partitioned into four residential density tiers that broadly correspond to County land use designations. The Single-Family Large Lot category includes all units at 2 units per acre or lower, which corresponds to the VR 2 (Village Residential 2) land use designation. The Single-Family Large Lot category includes detached housing at between 2 and 7.3 dwelling units per acre (equivalent to VR 2 to VR 7.3). The Multifamily Lower Density category includes all units at between 7.3 and 15 units per acre (equivalent to VR 7.3 to VR 15). Units in this category may include condominium, small-lot-detached, duplex, triplex, and townhome typologies. The Multifamily Higher Density category includes all units at between 15 and the County's upper limit of 30 units per acre (equivalent to 15 to VR 30). Units in this category may include townhome or stacked flats typologies with surface or podium parking. The SPA (Specific Plan Area) category includes all units that have been entitled though the Specific Plan Area process. (Note, SPA units, while treated here as a separate category, may have units that range in density from large-lot detached to high density multifamily.)

In the Base estimate, as shown in Figure 2, SPA units make up the largest share, at 38%, followed by 36% for Single-Family Large Lot and 12% for Single-Family Small Lot. In the High estimate, addition of all entitled but unbuilt SPA units increases the category contribution significantly and diminishes the other categories accordingly.

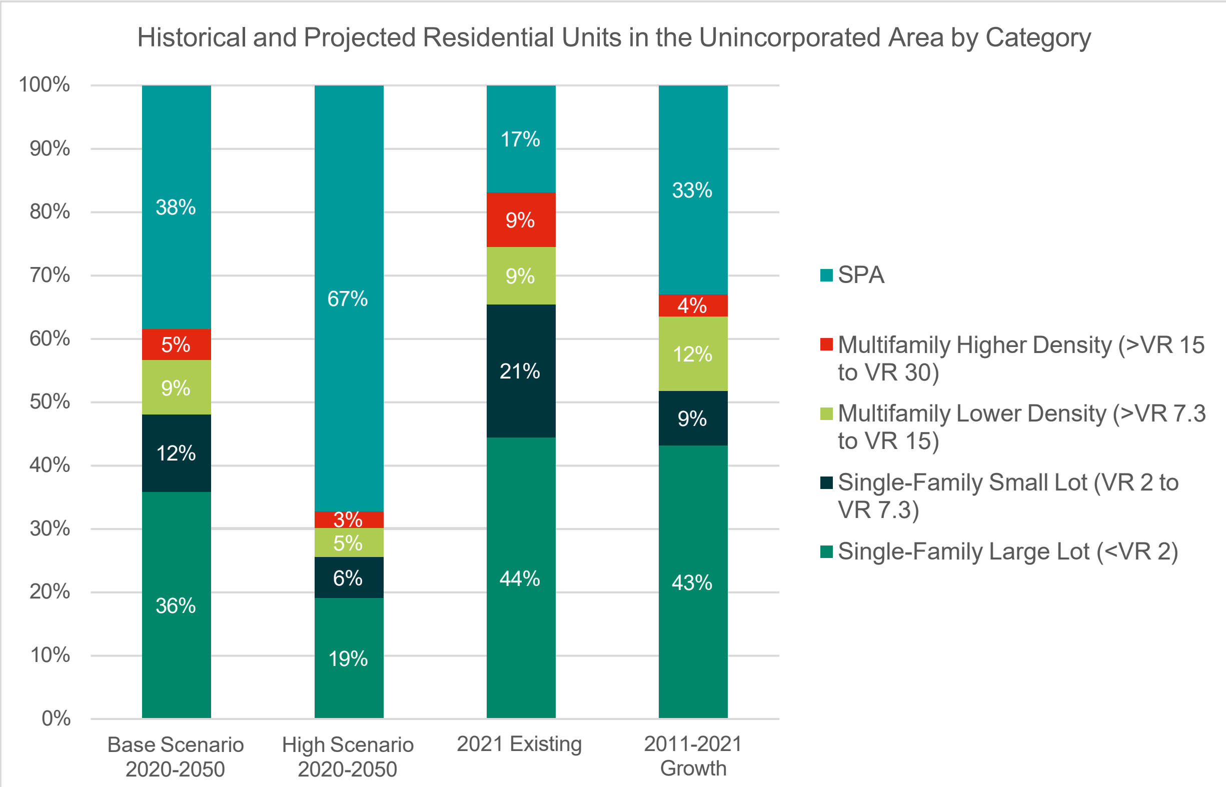
For context, Figure 2 also shows the existing (2021) category mix as well as the mix from the last ten years of growth (2011 to 2021). Historically, SPAs have always made a significant contribution to inventory in the unincorporated area (17% of total) and have seen even faster growth in the last 10 years (33% of total). This forecast anticipates even faster SPA growth, due primarily to the Otay CPA. Otay CPA includes the Otay Ranch Specific Plan Area, which for decades has been one of the fastest-growing planned communities in the nation. While nearly all Otay Ranch growth has occurred in the city of Chula Vista, future growth is expected to continue into the unincorporated area. (For further discussion of the Otay CPA population, housing and employment projections, see the Otay CPA Growth Forecast section below.)

Higher-density housing, as represented by the Multifamily Low Density and Multifamily High Density categories, has not been a significant contributor to unincorporated area housing inventory, with 18% share historically and 16% share of units built in the last ten years. The housing projections expect the share of these categories to continue to decline to 14% of total between 2020 and 2050 in the Base estimate.[6] This is attributable largely to consumer

[6] However, it is likely that a portion of growth characterized as "SPA" will include higher-density housing because, as noted above, SPAs typically include higher-density offerings in their unit mix.

preference for single-family housing in the unincorporated area, where generally lower housing costs make larger homes more affordable than in the incorporated jurisdictions.

Figure 2: Historical and Projected Residential Growth by Density Tier



Source: AECOM, County Housing Portal, County Assessor

Employment Projections

Employment in the unincorporated areas between 2020 and 2050 is estimated to grow by 21,165 in the Base estimate for a total increase of 19% at an average annual growth rate of 0.59%. This rate exceeds the estimated Base estimate growth rate for residential units, indicating a growing jobs/unit ratio attributable mainly to high expected employment growth in the Otay CPA. The East Otay Mesa Business Park Specific Plan, which is being developed as a major warehousing and logistics hub, is expected to import workers from nearby jurisdictions, from outside of San Diego County, and from across the border in Mexico. For the High estimate, employment is estimated to grow by 26,167 for a total increase of 23.7% at an annual growth rate of 0.71%. The assumed buildout of all entitled SPA units in this scenario is assumed to have a substantial spill-over impact on employment growth as well. For further discussion of employment projections, see the Employment Projections section below.

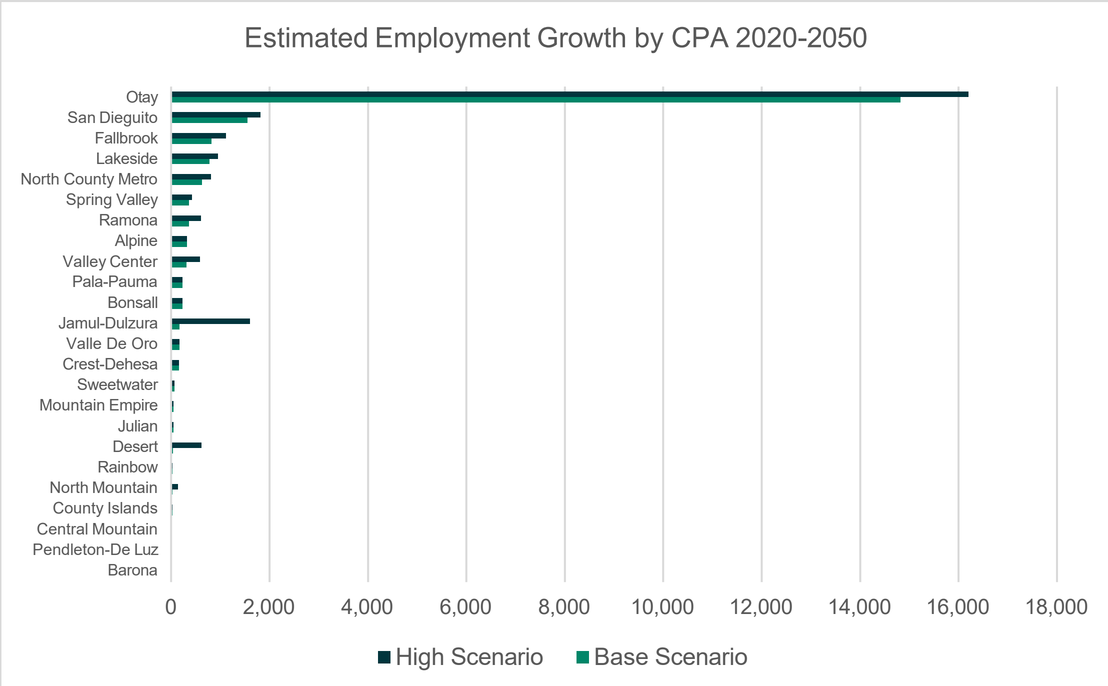
Table 4. Employment Growth Projections 2020-2050 Summary

Item	2020	2050	2020-50 # Change	2020-50 % Change	2020-50 Annual Growth Rate
Base Growth Estimate	110,636	131,801	21,165	19.13%	0.59%
High Growth Estimate	110,636	136,803	26,167	23.65%	0.71%

Source: AECOM

Estimated employment growth is distributed widely by CPA. In the Base estimate, Otay is the dominant source of new employment, with 70% of all new jobs expected between 2020 and 2050. San Dieguito is a distant second with 7% of all new jobs. The top-10 CPAs by growth in the Base estimate (from Otay to Pala Pauma, as shown in Figure 3) contribute 20,158 jobs between 2020 and 2050, equivalent to 95% of total forecast growth.

Figure 3: Employment Growth Ranked by CPA 2020-2050



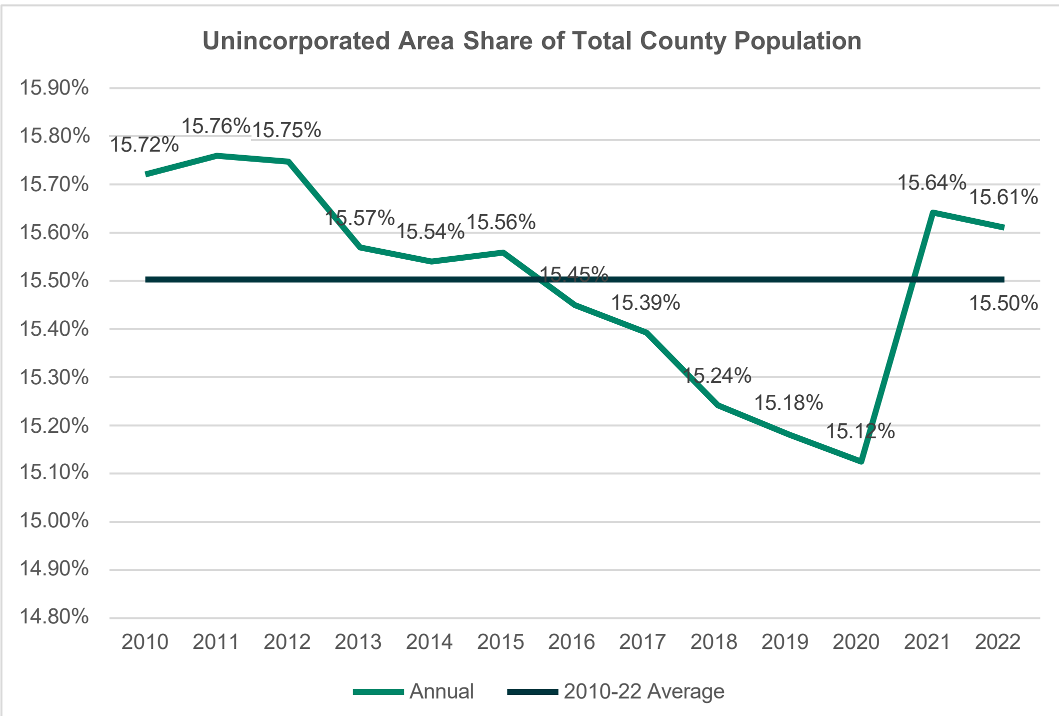
Source: AECOM

4. Population Projections

Projection for the Total Unincorporated Area

The unincorporated area population projection is derived from the California Department of Finance (DoF) schedule P2 for San Diego County, which estimates county population growth to the year 2060.[7] A portion of county growth is then allocated to the unincorporated area based on historical trends. As indicated by DoF schedule E-5 (Figure 4), the unincorporated area contributed between 15.12% and 15.76% of county population between 2010 and 2022. During this time, the incorporated area grew faster than the unincorporated area until the COVID-19 pandemic in 2020, when the trend reversed. To allocate a portion of total county growth to the unincorporated area, AECOM assumed a capture of 15.5% of county growth through 2050, which is the historical average contribution between 2010 and 2022. The 15.5% assumption is conservative as it balances the historical downward trend in unincorporated county share through 2020 with what may prove to be a permanent off-setting increase in the attractiveness of the unincorporated area attributable to the impact of remote work on commuting and residential settlement patterns.

Figure 4: Unincorporated Area Share of Total San Diego County Population



Source: California Department of Finance Schedule E-5, AECOM

To distribute population growth over time, AECOM derived compound annual growth rates (CAGR) at 10-year intervals (2020-2030, 2030-2040, 2040-2050) from the DoF P2 schedule and applied them to a 2020[8] base year population. This yielded an estimated population growth of 34,825 as shown in Table 5.

[7] The DoF P2 offered the most up-to-date set of regional growth estimates available at the time of the study. Source: California Department of Finance. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release), Sacramento: California. July 2021 (original lease from 03/05/21 referenced). www.dof.ca.gov/Forecasting/Demographics/Projections/
[8] 2020 base year population sourced from SANDAG (Current Estimates, July 21, 2021) to maintain consistency with the VMT and EIR analyses being conducted concurrently, which are also referencing SANDAG baseline data.

Table 5. Unincorporated Area Population Projection

	2020	2025	2030	2035	2040	2045	2050
Total Population	505,675	513,885	522,229	528,361	534,565	537,524	540,500
	2020-25	**2025-30**	**2030-35**	**2035-40**	**2040-45**	**2045-50**	**2020-50**
Incremental Population	8,210	8,344	6,132	6,204	2,959	2,976	34,825

Source: AECOM

Population Projections Allocated by CPA

Population projections are allocated to each CPA by applying population/unit ratios to residential unit projections. (For a description of how residential growth projections at the CPA level are derived from the area-wide population projection, see Chapter 5 Residential Unit Projections below.) The base year 2020 population/unit ratios for each CPA are based on 2020 SANDAG data[9]. These are then scaled so that the average population/unit for the entire unincorporated area falls at a rate of -0.05% per year, which is the historical average decline from 1990 to 2022. (For further discussion of these assumptions, see the section in Chapter 5. The resulting population/unit ratios are shown in Table 6.

Table 6. Population/Unit Ratios for Estimating Population Growth by CPA

SPA	2020	2025	2030	2035	2040	2045	2050
Alpine	2.66	2.66	2.67	2.67	2.67	2.67	2.67
Barona	2.69	2.69	2.69	2.69	2.69	2.69	2.69
Bonsall	2.53	2.53	2.54	2.54	2.54	2.54	2.54
Central Mountain	2.37	2.37	2.38	2.38	2.38	2.38	2.38
County Islands	3.45	3.46	3.47	3.47	3.48	3.47	3.47
Crest-Dehesa	2.74	2.75	2.75	2.75	2.75	2.75	2.75
Desert	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Fallbrook	2.64	2.64	2.65	2.65	2.65	2.65	2.65
Jamul-Dulzura	2.88	2.89	2.89	2.89	2.89	2.89	2.89
Julian	1.93	1.93	1.93	1.93	1.93	1.93	1.93
Lakeside	2.69	2.69	2.70	2.70	2.70	2.70	2.70
Mountain Empire	2.60	2.60	2.60	2.60	2.61	2.61	2.61
North County Metro	2.75	2.75	2.75	2.75	2.75	2.75	2.75
North Mountain	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Otay	1,347	1,347	64.58	24.18	12.15	8.31	6.59
Pala-Pauma	2.81	2.81	2.81	2.81	2.82	2.82	2.82
Pendleton-De Luz	5.79	5.79	5.79	5.79	5.79	5.79	5.79
Rainbow	2.89	2.89	2.89	2.89	2.89	2.89	2.89
Ramona	2.76	2.77	2.77	2.77	2.77	2.77	2.77
San Dieguito	2.73	2.73	2.73	2.74	2.74	2.74	2.74
Spring Valley	2.93	2.94	2.94	2.94	2.94	2.94	2.94
Sweetwater	2.79	2.79	2.79	2.79	2.79	2.79	2.79
Valle De Oro	2.67	2.67	2.67	2.67	2.67	2.67	2.67
Valley Center	2.60	2.60	2.60	2.60	2.60	2.60	2.60
Total	**2.863**	**2.863**	**2.863**	**2.863**	**2.862**	**2.862**	**2.862**

These ratios are applied to the Base residential growth projections (shown later in the report in Table 16) to generate the Base population projections shown in Table 7.

Table 7. Final Population Projections by CPA (Base Estimate)

SPA	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	317	306	209	182	46	37	1,097
Barona	0	0	0	0	0	0	0
Bonsall	242	238	159	139	33	30	841
Central Mountain	73	73	47	42	12	7	254
County Islands	92	88	58	54	10	10	312
Crest-Dehesa	160	154	104	91	22	19	550
Desert	54	53	36	31	7	6	187
Fallbrook	1,319	1,279	866	758	184	154	4,560
Jamul-Dulzura	220	216	145	126	29	26	762
Julian	63	61	40	36	10	8	218
Lakeside	1,210	1,169	796	693	169	141	4,178
Mountain Empire	97	93	63	57	13	10	333
North County Metro	849	826	559	490	119	102	2,945
North Mountain	49	46	32	27	7	7	168
Otay	0	379	753	1,491	1,816	2,020	6,459
Pala-Pauma	69	65	44	38	11	8	235
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	15	15	9	9	3	3	54
Ramona	646	627	423	370	89	72	2,227
San Dieguito	1,132	1,100	738	648	160	131	3,909
Spring Valley	844	818	557	487	119	97	2,922
Sweetwater	124	121	82	72	17	14	430
Valle De Oro	255	245	165	147	35	29	876
Valley Center	380	367	250	218	53	44	1,312
Total	**8,210**	**8,339**	**6,135**	**6,206**	**2,964**	**2,975**	**34,829**

Source: AECOM

Applying the ratios to the high residential growth projections (shown in Table 17) results in the High estimate Population growth projections shown in Table 8. (For further discussion of how the High estimate is determined, see the Residential Growth by CPA and Density Tier (High Estimate) section below.)

Table 8. Final Population Projections by CPA (High Estimate)

SPA	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	317	306	209	182	46	37	1,097
Barona	0	0	0	0	0	0	0
Bonsall	242	238	159	139	33	30	841
Central Mountain	73	73	47	42	12	7	254
County Islands	92	88	58	54	10	10	312
Crest-Dehesa	160	154	104	91	22	19	550
Desert	691	698	508	504	229	227	2,857
Fallbrook	1,720	1,682	1,162	1,056	323	294	6,237
Jamul-Dulzura	1,754	1,769	1,282	1,268	563	556	7,192
Julian	63	61	40	36	10	8	218
Lakeside	1,427	1,388	957	855	245	216	5,088
Mountain Empire	97	93	63	57	13	10	333
North County Metro	1,053	1,032	708	641	189	174	3,797
North Mountain	245	246	177	173	76	73	990
Otay	2,780	3,192	2,814	3,560	2,781	2,983	18,110
Pala-Pauma	69	65	44	38	11	8	235
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	15	15	9	9	3	3	54
Ramona	1,012	998	695	642	218	197	3,762
San Dieguito	1,294	1,264	858	767	215	186	4,584
Spring Valley	960	936	643	572	157	136	3,404
Sweetwater	124	121	82	72	17	14	430
Valle De Oro	255	245	165	147	35	29	876
Valley Center	656	647	455	423	150	143	2,474
Total	**15,099**	**15,311**	**11,239**	**11,328**	**5,358**	**5,360**	**63,695**

Source: AECOM

5. Residential Unit Projections

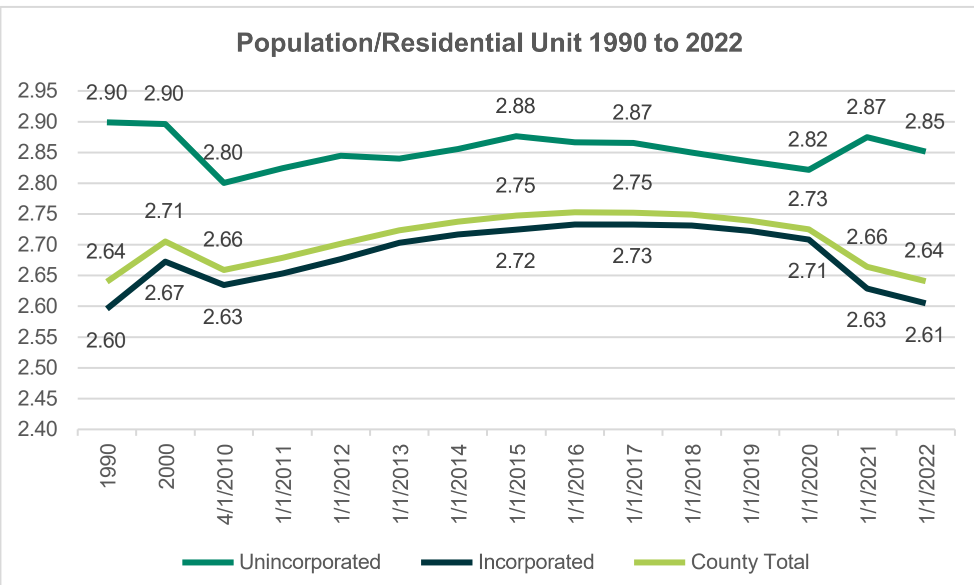
Residential unit projections are based on an estimate of total unincorporated county area demand based on population growth, an analysis of the supply of marketable development sites, and an assumed capture of housing demand per CPA based on historical patterns of residential development and other considerations. The three-step process (total unincorporated area housing demand, marketable site supply analysis, allocation to CPAs) is described further in the sections below.

Unincorporated Area Housing Demand

Total housing demand for the unincorporated county area is derived by applying population-to-unit ratios derived from historical trends to the population projections.

As shown in Figure 5, the unincorporated county area has historically had higher population/unit rates than the jurisdictions. From 2015 to 2020, population/unit ratios declined in both the incorporated and unincorporated areas, but in 2020, the rate of decline accelerated in the incorporated area while population/unit increased in the unincorporated area. This pattern of outmigration from populous coastal areas to more affordable inland areas was mirrored elsewhere in California during the initial phase of the COVID-19 pandemic. Even as the pandemic subsides, demographers expect this small shift between coastal and inland area populations to persist as more affordable housing opportunities inland and increased opportunity to work from home continue to attract in-migration.

Figure 5: Historical Population/Unit Ratios in San Diego County



Source: California Department of Finance Schedule E-5

At the same time, household sizes overall are expected to continue to decline as falling birthrates lead to smaller families and an aging overall population. To reflect this future decline, the housing projections assume a falling population/unit rate, calculated (as also noted in the Population Projections section above) as the average measured rate of change in population/unit in the unincorporated area between 1990 and 2022, which is an annual average decline of -0.05%. This rate is applied to the population projections to estimate housing growth in five-year increments as shown in Table 9. (The 2020 base year ratio is derived from 2020 SANDAG data.) This yields a total unit growth estimate of 12,239. This estimate indicates more units for the same population relative to the number of units needed if household size were not to decline.

Table 9. Residential Unit Growth Estimates

Item	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Draft Population Projection	8,210	8,344	6,132	6,204	2,959	2,976	34,825
Assumed Pop/Unit Ratio	2.86	2.85	2.84	2.84	2.83	2.82	2.85
Estimated Residential Units	**2,871**	**2,926**	**2,156**	**2,187**	**1,046**	**1,053**	**12,239**

Source: AECOM

Marketable Site Supply

To help allocate residential unit demand by CPA and by density category, AECOM conducted an analysis to determine a qualified supply of development sites. This qualified supply provides a way to constrain growth at the CPA level and by housing type and density where the supply of suitable sites is lower than estimated demand. The qualifying process entails screening a base set according to regulatory capacity, financial feasibility, infrastructure support, and physical site characteristics, as further described in the process below.

1. The **Base Set** is drawn from assessor data of all residential and residential mixed-use parcels in the unincorporated county Area. While assessor data and County Housing Production and Capacity portal data overlap considerably, AECOM used assessor data as the base set for the analysis, because it provides richer information about underlying land use designations, existing improvements, land and improvement values, and physical site characteristics. The Base Set is modified to **exclude several land use categories** that do not offer strong potential to increase residential unit capacity by 2050, as follows:

    - **Condominiums.** Condominium projects are assumed to be fully built out, and shared ownership of common areas makes site assembly challenging for redevelopment. Furthermore, the increase in density required to feasibly redevelop parcels already improved with condominium uses is typically well above the maximum 30 units per acre allowed in the unincorporated area.

    - **Mobile home parks.** Mobile parks are already built out at relatively high density, and redevelopment is unlikely to increase unit count significantly. In addition, tenant protections and RHNA requirements can cause redevelopment of a mobile home park to be prohibitively costly due to tenant relocation costs and the requirement that all lost units be replaced with new low-income units.

    - **Specific Plan Areas.** Built-out parcels in Specific Plan Areas (SPAs) are typically bound by Covenants, Conditions, and Restrictions (CCRs) that limit redevelopment potential that would increase density. (Note: unbuilt SPA capacity is treated differently and added later in this analysis.)

2. **Financial Feasibility Filters** eliminate parcels with characteristics that make financially feasible development challenging. The financial feasibility filters eliminate 74% of the Base Set, equivalent to 178,000 potential units. The filters include improvement ratios, replacement unit ratios, and parcel size, which are described further below:

    - **Improvement Ratio**[10]: All parcels with improvement ratios equal to or greater than 1.0 (i.e., where improvement value is equivalent to land value) are eliminated to exclude those that may already be substantially or fully improved. Parcels with high improvement ratios typically require major up-zoning to be feasible for redevelopment. While it is likely that improvement ratios will fluctuate slightly by 2050 due to shifting market conditions that both increase and decrease the value of improvements relative to land, too few will cross the 1.0 threshold to impact the overall findings meaningfully.

    - **Replacement Unit Ratio**[11]: All parcels with a Replacement Unit Ratio of less than 3.0 are eliminated, which removes parcels without capacity to replace an existing unit with more than two units. This is a proxy for development feasibility, which assumes that redeveloping a residential property will require, at minimum, tripling the number of units on site.[12]

[10] Improvement ratio is defined as improvement value from the County Assessor divided by land value
[11] Replacement unit ratio is defined as allowable units per land use designation divided by existing units.
[12] Note: Replacement Unit Ratio does not specifically consider ADUs as an alternative. For a discussion of the potential for ADUs to increase unit capacity, see the section A Note on ADUs below.

- **Feasible Parcel Size**: All parcels zoned for 15 dwelling unit per acre (DU/AC) or greater, smaller than 0.5 acres are eliminated because higher-density projects in non-urban areas typically require larger sites for feasible housing products.

3. **Infrastructure Support Filters** excludes parcels that lack the underlying infrastructure for near-term development, specifically with respect to road and water infrastructure. The infrastructure filters eliminate another 5% from the qualified set, equivalent to 13,000 potential units and include the following:

- **Road Infrastructure** filter excludes parcels that do not intersect a road or are more than one-quarter mile from a freeway, highway, arterial, or connector road[13].

- **Waterline** filter excludes parcels outside of the waterline with designated density greater than 7.3 DUAC, per County directive prohibiting multifamily development outside the waterline.

4. **Physical Site Capacity Filters** excludes parcels or lower the parcel development capacity on parcels on steep slopes, defined by the County as having a gradient greater than 25%. The physical site capacity filters eliminate another 1% of the Base Set, equivalent to 2,800 potential units and include the following:

- **SR-designated parcels**: Allowable density and buildable area is reduced, per County guidelines, where slope gradient is greater than 25%.

- **RL-designated parcels** are eliminated where unbuilt unit capacity is located on a parcel smaller than 6,000 square feet at 25% or higher grade, which is needed to accommodate both unit and access road.[14]

- **VR-designated parcels** are all included regardless of slope grade, which is consistent with County guidelines.

5. **Adjustments to Specific-Plan Area Capacity:** AECOM conducted a separate analysis to qualify entitled but unbuilt Specific Plan Area (SPA) units as marketable. Although entitled, some unbuilt SPA capacity is less feasible due to factors related to market trends and infrastructure support.[15] The marketability of unbuilt SPA capacity is evaluated in a multi-step process, as follows:

   Assembled a Master Set of entitled but unbuilt SPA capacity using data from the County Assessor and General Plan GIS layers, which was further adjusted and validated by reviewing adopted Specific Plan/General Plan Amendment documents and a County-maintained index of SPA projects. This unbuilt capacity totals 16,703 units located in 12 of 24 CPAs, as shown in

- .

- **Reviewed SPA development trends** in the unincorporated area to understand development patterns by project, by CPA, by unit type, and by rate of absorption. Data for the trend analysis was drawn primarily from building permit data. The analysis revealed a range of activity at different SPA projects with some very active and others inactive and containing unused entitlements going back decades. (See Table 47 in the Appendix for full summary of SPA inventory and growth). Building permit data extends back to 2010 and provides a reliable assessment of new, active, and dormant projects.

- **Eliminate inactive projects** from qualified capacity by classifying unbuilt SPA capacity by activity level, referencing the development trend analysis conducted in the prior step. SPA projects entitled before 2011 but inactive with no new development since 2011 are removed from qualified capacity.[16]

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[13] The quarter-mile assumption is based on prior AECOM experience in San Diego County. While larger subdivisions are typically required to provide off-site road infrastructure, most of these occur in SPA projects, which are not subject to this filter. For projects considered by this filter, such off-site costs are typically cost-prohibitive beyond a quarter mile from the existing street network. Consequently, these parcels were removed from the marketable supply due to low probability of development.
[14] RL threshold from AECOM, based on prior experience with development feasibility in RL areas.
[15] As noted in an earlier footnote, in this report, "SPA" units refer to units entitled through both Specific Plan Amendments and General Plan Amendments (GPAs). Both SPA- and GPA-initiated units, once adopted, are identified by the "SPA" land use designation. Historically, SPAs have been a major source of housing production in the unincorporated county.
[16] The inactivity screen also eliminated over 1,000 entitled units at Desert - Rams Hill in Borrego Springs from qualified capacity, as only one unit in the project was built during the 2011-2020 period.

- **Eliminate additional qualified SPA capacity from Jacumba Valley Ranch,** in Mountain Empire, where development of 1,244 entitled units is on permanent hold because the area has been leased for solar power generation through 2050.

As a result of these adjustments, unbuilt SPA capacity is reduced by 3,437 units, from 16,703 to 13,266. In addition to the reduction in Mountain Empire units noted above, 1,449 entitled SPA units are eliminated from the Desert SPA, 358 from North Mountain, 233 from San Dieguito, and 153 from North County Metro.

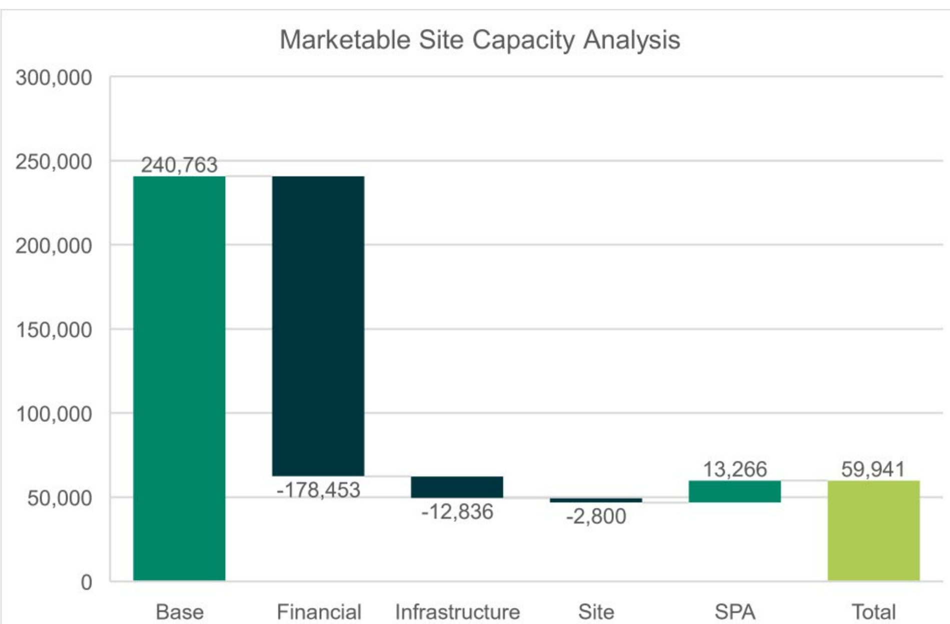
Table 10. Total Unbuilt SPA Capacity

	Master Set of Unbuilt SPA Units	Marketable Set of Unbuilt SPA Units
Desert	1,811	362
Fallbrook	1,273	1,273
Jamul-Dulzura	2,209	2,209
Lakeside	421	421
Mountain Empire	1,244	0
North County Metro	694	541
North Mountain	358	0
Otay	6,082	6,082
Ramona	542	542
San Dieguito	1,276	1,043
Spring Valley	340	340
Valley Center	453	453
Total	**16,703**	**13,266**

Source: AECOM

Applying the five filters to a base set of parcels representing approximately 241,000 potential units results in a reduction of approximately 75%, yielding a marketable capacity of 59,924 units, as shown in Figure 4.

Figure 4. Marketable Site Supply Analysis



Source: AECOM

These potentially marketable units can further be distributed by density type, as shown in Table 11, and by CPA, as shown in Table 12. The CPAs of North County Metro, Otay, and Desert have the largest number of marketable sites.

Buildable capacity from the County Housing Production and Capacity Portal, shown for comparison in Table 12, shows strong overlap between the two approaches. Major differences are tied to the estimation methodologies: where the County Housing Production and Capacity Portal focuses mainly on the capacity of vacant and unimproved lots, the Qualified Capacity analysis includes improved lots that can be redeveloped and eliminates lots that for economic, infrastructure, and site considerations present significant development challenges.

Table 11: Marketable Site Capacity Estimate by Category

Marketable Capacity by Residential Category		
	Marketable Units	Share of Total
Low Density (<VR 2)	26,186	44%
Medium-Low Density (VR 2 to VR 7.3)	9,790	16%
Medium-High Density (>VR 7.3 to VR 15)	4,403	7%
High-Density (>VR 15 to VR 30)	6,295	11%
SPA	13,266	22%
Total	**59,941**	**100%**

Source: AECOM

Table 12: Marketable Site Capacity Estimate and Housing Portal Capacity by CPA

Marketable Capacity by CPA		
	Marketable Capacity[1]	Housing Portal[2]
Alpine	6%	5%
Barona	0%	0%
Bonsall	5%	3%
Central Mountain	1%	1%
County Islands	2%	0%
Crest-Dehesa	1%	1%
Desert	10%	13%
Fallbrook	10%	9%
Jamul-Dulzura	6%	6%
Julian	1%	1%
Lakeside	7%	5%
Mountain Empire	2%	5%
North County Metro	13%	16%
North Mountain	1%	2%
Otay	10%	5%
Pala-Pauma	2%	3%
Pendleton-De Luz	0%	1%
Rainbow	1%	1%
Ramona	6%	8%
San Dieguito	4%	2%
Spring Valley	2%	1%
Sweetwater	1%	1%
Valle De Oro	1%	1%
Valley Center	9%	10%
Total Unincorporated	**59,941**	**61,255**

Source: (1) AECOM, (2) County of San Diego

A Note on ADUs

California State Legislation AB345 and SB9 include provisions supporting production of Accessory Dwelling Units (ADUs). The legislation allows single family lots to be subdivided without discretionary review or rezoning for higher density, enabling single-family lots to support up to four units. Early data from ADU applications in different California jurisdictions suggests that the legislation has stimulated growing interest in ADUs.

However, the housing projections in this report do not treat ADUs as a separate category or density tier, because insufficient data exists at this moment to forecast where—by CPA or land use designation—ADUs will be constructed.. Finally, because the housing forecast is based primarily on expected population growth, it is reasonable to assume that ADUs that do enter the housing supply will displace rather than supplement production in other housing categories.

Residential Growth by CPA and Density Tier (Base Estimate)

The 12,239 residential units of estimated residential growth in the unincorporated county area is allocated by CPA and by density tier using a three-step process:

1. Prepare a growth forecast for the Otay CPA
2. Apply capture rates based on historical trends for the other 23 (non-Otay) CPAs
3. Adjust growth allocations by filtering estimates through the marketable site supply analysis

A discussion of each step follows below.

Otay CPA Growth Forecast

The Otay CPA has the strongest potential among the 24 CPAs for residential growth through 2050. Currently, the CPA has no residential uses and a small number of commercial uses, but Otay Ranch just west in the City of Chula Vista has been one of the fastest growing residential areas in the country, producing over 10,000 units since the middle 1990s. With growth moving rapidly from west to east through Chula Vista, development should soon arrive in the Otay CPA. An ambitious commercial development plan for a large warehouse and logistics center in Otay CPA should also have a positive impact on residential development.

Three specific plan areas guide growth within the Otay CPA:

- **The East Otay Mesa Business Park Specific Plan** (EOMSP) is programmed primarily as an industrial and business center with an additional portion set aside for mixed-use residential, low-density residential, and conservation uses. The Plan Area, which occupies a strategic border location near the Otay Mesa Port of Entry with Mexico, has attracted several major commercial projects. Demand in the SPA has been estimated for between 17.6 and 24 million square feet of industrial space.[17]
- **The Otay Ranch Resort Village Specific Plan** is a mixed-use community featuring a hotel-anchored resort, single-family residential uses, and a relatively small quantity of office and commercial uses. The location is largely undeveloped and will require construction of three entrance roads for access and substantial grading to create development pads.[18]
- **The Otay Ranch Village 14 and Planning Areas 16/19 Project** is a mixed-use community featuring a village core and 1,119 residential units[19].

Total residential development capacity of the three plan areas is 6,215 units, as shown in Table 13.

[17] *Assessment Of Most Marketable Uses, East Otay Specific Plan,* Meyers Research and Metro Study, December 2020
[18] Due to project changes since the development of this study, the inclusion of some of these projects follows a conservative approach that would result in increased GHG emissions that would be mitigated under the County's CAP. For example, the status of Village 13 is uncertain, as an application has been submitted to LAFCO to annex the properties to the City of Chula Vista.
[19] A proposed project amendment would increase residential units by 147 to 1,266

Table 13: Otay CPA Specific Plans (As of July 2022)[20]

SPA	Program	Residential Units
East Otay Mesa Business Park Specific Plan	Industrial, office, mixed-use village	3,158
The Otay Ranch Resort Village Specific Plan	Village 13: Resort, mixed-use residential/commercial, single-family residential	1,938
Otay Ranch Village 14 and Planning Areas 16/19	Village 14/ Planning Areas 16 & 19:	1,119
Total		**6,215**

Source: The County of San Diego

In addition to potential Otay CPA units, Otay Ranch in Chula Vista adds a potential pipeline of 14,213 units, as shown in Table 14. Combined with the potential Otay CPA units, the greater Otay Mesa area has potential capacity for 20,428 units.

Table 14: Otay Ranch Residential Pipeline and Area Supply

Village	Status	Units
Village 2	Under Development	2,101
Village 3	Under Development	360
Village 8 W	Under Development	2,092
Eastern Urban Center	Under Development	1,039
Freeway Commercial	Under Development	313
Subtotal Under Development		**5,905**
Village 8 E	Entitled	2,609
Village 9	Entitled	3,959
Village 10	Entitled	1,740
Subtotal Entitled		**8,308**
Total Chula Vista Otay Ranch Pipeline		**14,213**
Total Otay CPA Entitlements		**6,215**
Total Potential Area Supply		**20,428**

Source: City of Chula Vista, County of San Diego

From the mid-1990s through 2021, Otay Ranch in Chula Vista added an average of 380 units per year. From 2011 to 2021, growth was even faster, at approximately 480 units per year. Given the continuing appeal of the Otay Ranch area, growth is likely to continue within the range of these historical rates to support between 11,400 and 14,300 units by 2050. The sites in Chula Vista are likely to capture most of this growth due to location, infrastructure, and regulatory advantages over sites within the Otay CPA:

- **Location:** Chula Vista's site supply is closer to the San Diego urban core than the County's supply. The distance from the eastern edge of the Otay Ranch development to downtown San Diego is approximately 17 miles, compared to 23 miles from the proposed village at East Otay Mesa Business Park, 23 miles from proposed Village 13, and 23 miles from proposed Village 14.
- **Infrastructure:** Both the Otay Ranch Resort Village Specific Plan and the Otay Ranch Village 14 and Planning Areas 16/19 are greenfield opportunities that will require substantial infrastructure including drainage, sewerage, roads, and water facilities. By comparison, the Otay parcels in Chula Vista are largely graded and served by finished infrastructure.
- **Regulatory:** In October 2021, a Superior Court judge vacated County approval of the Village 13, Village 14, and Planning Areas 16 & 19 projects due to insufficient protection from wildfire risk. To continue development, the developers must first prepare and re-submit a new mitigation plan, which will delay the projects substantially.

For the Base Growth Estimate, AECOM has assumed that residential growth will follow the recent 2011-2021 annual rate, resulting in approximately 14,300 units by 2050, as shown in Table 15. To distribute this growth, AECOM

[20] While the status of some of these projects may have changed since the study's development, this analysis is intended to reflect market conditions in the unincorporated county. These projects are still representative of these market conditions.

assumed, based on the factors noted above, that neighborhoods in Chula Vista are likely to absorb most of the demand in the coming years, as these developments are both better connected to infrastructure and amenities and directly adjacent to the historical path of residential growth. From this, AECOM assumed Chula Vista will build most of its proposed units by 2050 (85%) for a total of 12,100 units, leaving 2,200 units of growth potential to be absorbed by neighborhoods in the Otay CPA. For these, AECOM assumed 35% capture of proposed units in each of the three main Otay planning areas. The High Growth Estimate assumes that all proposed units (6,215) will be built.

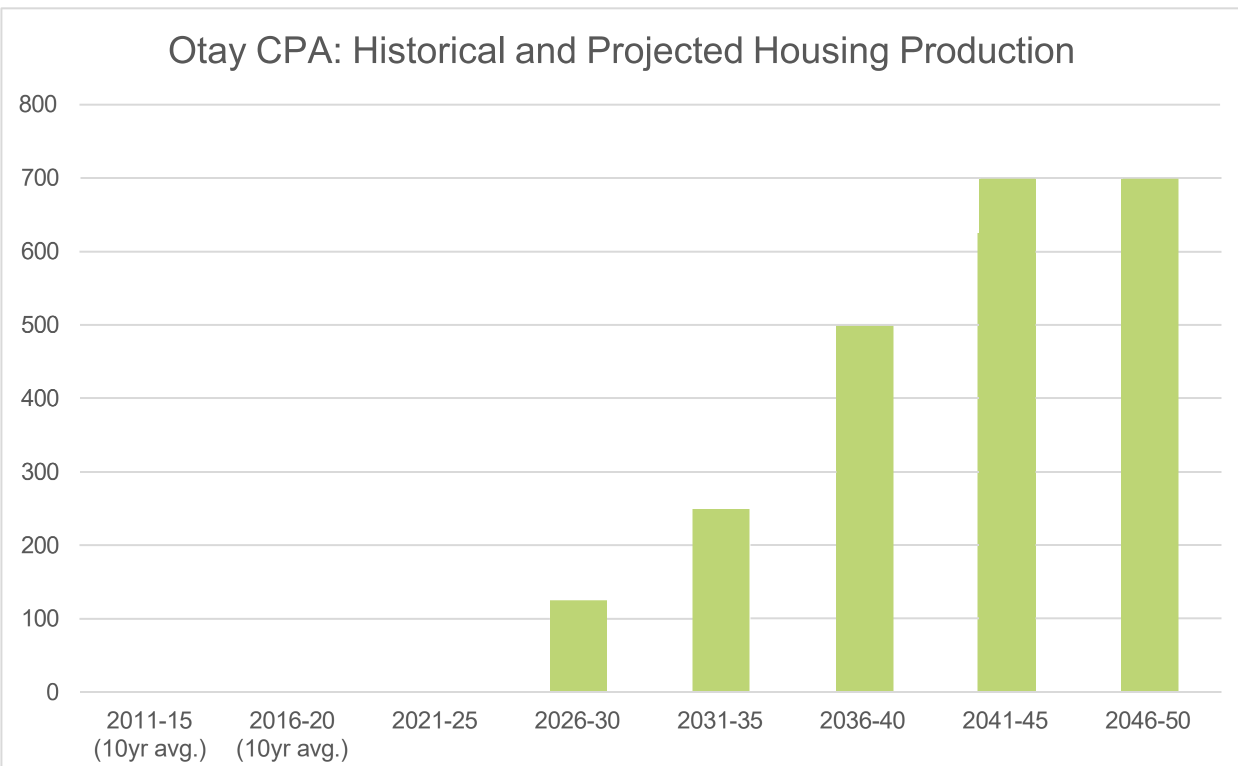
Table 15: Otay Ranch Estimated 2020-2050 Residential Build-Out

Area	Proposed Units	Capture 2020-2050	2020-2050 Buildout (Rounded)
Chula Vista	**14,200**	**85%**	**12,100**
Unincorporated San Diego County			
East Otay Mesa Business Park Specific Plan	3,158	35%	1,100
The Otay Ranch Resort Village 13 Specific Plan	1,938	35%	700
Otay Ranch Village 14 and Planning Areas 16/19	1,119	35%	400
Subtotal Unincorporated Area	**6,215**	**35%**	**2,200**
Total	**20,415**	**70%**	**14,300**

Source: AECOM

This growth is assumed to occur in Otay CPA starting in 2026 and increase steadily through 2050, as shown in Figure 6.

Figure 6: Otay CPA Residential Growth Projection 2020-2050 (Base Estimate)

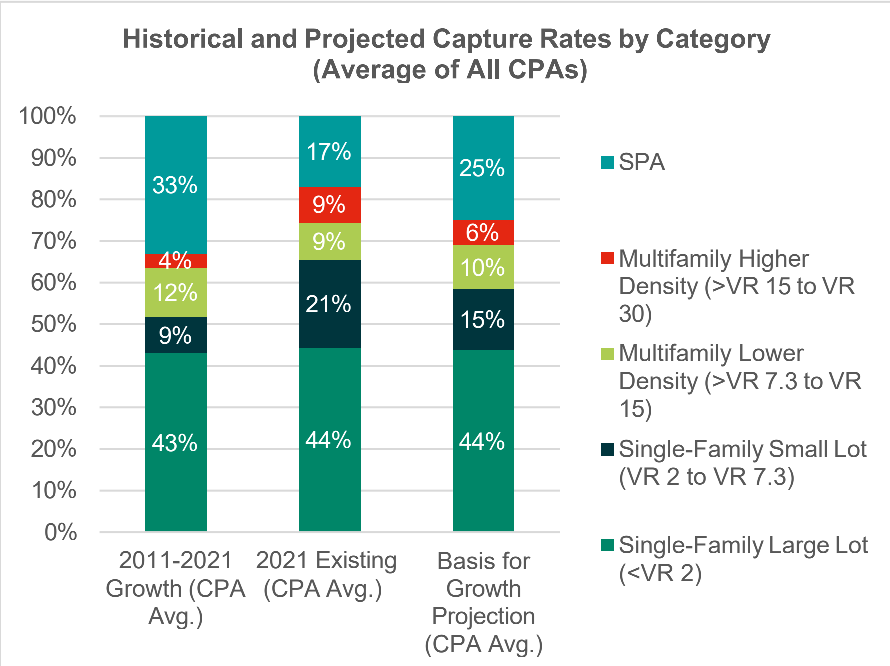


Source: AECOM

Allocation to Other CPAs Based on Historical Trends

As discussed above, total housing demand for the unincorporated county area is estimated at 12,239 units through 2050. Deducting the estimated 2,200 Otay CPA units leaves 10,039 units to be allocated across the other 23 CPAs. The allocation is conducted by applying capture rates based on historical trends: share of total inventory by CPA and density tier (historical fair share) and share of recent growth (2011-2021) by CPA and density tier. By weighting the historical fair share and recent growth shares equally, long-term and short-term activity is reflected in the projection. Fair share, recent growth, and projection basis rates are shown in Figure 7.

Figure 7. Historical and Projected Residential Mix by Density Tier



Source: County Assessor, AECOM

Check Against Supply of Marketable Sites

The draft projections resulting from the prior steps are then checked against qualified supply (as shown in Table 11 and Table 12). Where the draft projections exceed qualified supply, excess demand is re-directed to the closest CPA with available capacity. A total of 558 units are re-directed in this way, with Pendleton-De Luz and Valle De Oro CPAs seeing the most redirected units. For example, the draft forecast for Pendleton-De Luz indicates demand for 212 single-family large lot units. However, because all future residential growth in the CPA is expected to be military housing (and not counted in this forecast), this demand is redirected to Bonsall (25% of the 212 units) and Fallbrook (75%). For Valle De Oro, forecast demand exceeds capacity for multifamily lower density (by 8 units) and multifamily higher density (by 42 units). This demand is redirected to the County Islands CPA. For a summary of all demand exceeding marketable site supply and how it is re-directed, see Table 46 in the Appendix.

Final Projections

The adjusted final Base estimate housing projections by CPA are shown in Table 16. For further breakdown by residential type, see Table 31, Table 33, Table 35, Table 37, and Table 39 in the Appendix. For charts showing incremental housing growth for 2000-2050 for the top-10 CPAs, see the Appendix section titled Incremental Housing Growth 2000-2050 for the Top 10 CPAs.

Table 16: Final Base Residential Unit Growth Projection by CPA

SPA	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	112	109	75	66	17	14	393
Barona	0	0	0	0	0	0	0
Bonsall	90	89	60	53	13	12	317
Central Mountain	29	29	19	17	5	3	102
County Islands	25	24	16	15	3	3	86
Crest-Dehesa	55	53	36	32	8	7	191
Desert	36	35	24	21	5	4	125
Fallbrook	471	459	313	277	69	58	1,647
Jamul-Dulzura	72	71	48	42	10	9	252
Julian	31	30	20	18	5	4	108
Lakeside	423	411	282	248	62	52	1,478
Mountain Empire	35	34	23	21	5	4	122
North County Metro	291	285	194	172	43	37	1,022
North Mountain	21	20	14	12	3	3	73
Otay	0	125	250	500	625	700	2,200
Pala-Pauma	23	22	15	13	4	3	80
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	5	5	3	3	1	1	18
Ramona	220	215	146	129	32	26	768
San Dieguito	391	382	258	229	58	48	1,366
Spring Valley	271	264	181	160	40	33	949
Sweetwater	42	41	28	25	6	5	147
Valle De Oro	90	87	59	53	13	11	313
Valley Center	138	134	92	81	20	17	482
Total	**2,871**	**2,924**	**2,156**	**2,187**	**1,047**	**1,054**	**12,239**

Source: AECOM

Residential Growth by CPA and Density Tier (High Estimate)

The Base Growth estimate reflects a market- and trend-based understanding of housing growth in which only a portion of marketable SPA capacity is built out, based on historical patterns. However, it is arguable that all SPA projects could develop to their full entitled capacity by 2050.

Adopted SPA projects offer some advantages to developers and builders over other kinds of projects. SPA sites are already entitled, which can expedite the development process and allow builders to exploit market opportunities quickly. SPA projects are typically large and offer scale economies that lower per-unit costs. SPA projects allow greater control in master planning, landscape design, residential design, and provision of community amenities, which can increase marketability and consumer appeal. SPA projects are well known to residents, as they have long contributed a large proportion of unincorporated area growth (23% of all unincorporated area units as of 2021 and 33% of units developed between 2011 and 2021). Finally, entitled SPA units may be exempt from future regulatory policies that could influence the cost and location of housing development over the 2020-2050 period. Such policies may include restrictions on development in rural areas because of environmental sensitivity or fire-hazards. A pool of entitled SPA sites exempt from new housing policies could absorb displaced growth from the unincorporated area and incorporated San Diego County jurisdictions.

In order to consider a scenario where all potential SPA units are built out, AECOM developed a High growth estimate. The High growth estimate adds buildout of all entitled unbuilt SPA units not included in the Base estimate (excepting those shown in as non-viable). As such, the High estimate is additive to the Base Estimate. This High estimate and the Base estimate together describe a broad range of potential outcomes.

As a result of adding all remaining marketable unbuilt SPA capacity, totaling 10,758 units, total estimated residential growth in the High estimate reaches 22,997 units as shown in Table 17.

Table 17: Final High Residential Growth Projection by CPA

Item	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	112	109	75	66	17	14	393
Barona	0	0	0	0	0	0	0
Bonsall	90	89	60	53	13	12	317
Central Mountain	29	29	19	17	5	3	102
County Islands	25	24	16	15	3	3	86
Crest-Dehesa	55	53	36	32	8	7	191
Desert	458	465	341	342	159	159	1,924
Fallbrook	614	604	420	386	121	111	2,256
Jamul-Dulzura	573	581	424	424	193	192	2,387
Julian	31	30	20	18	5	4	108
Lakeside	499	488	339	306	90	80	1,802
Mountain Empire	35	34	23	21	5	4	122
North County Metro	361	356	246	225	68	63	1,319
North Mountain	105	106	77	76	34	33	431
Otay	911	1,052	934	1,194	957	1,034	6,082
Pala-Pauma	23	22	15	13	4	3	80
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	5	5	3	3	1	1	18
Ramona	345	342	240	224	78	71	1,300
San Dieguito	447	439	300	271	78	68	1,603
Spring Valley	308	302	209	188	53	46	1,106
Sweetwater	42	41	28	25	6	5	147
Valle De Oro	90	87	59	53	13	11	313
Valley Center	238	236	167	157	57	55	910
Total	**5,396**	**5,494**	**4,051**	**4,109**	**1,968**	**1,979**	**22,997**

Illustration: San Dieguito Housing Projections

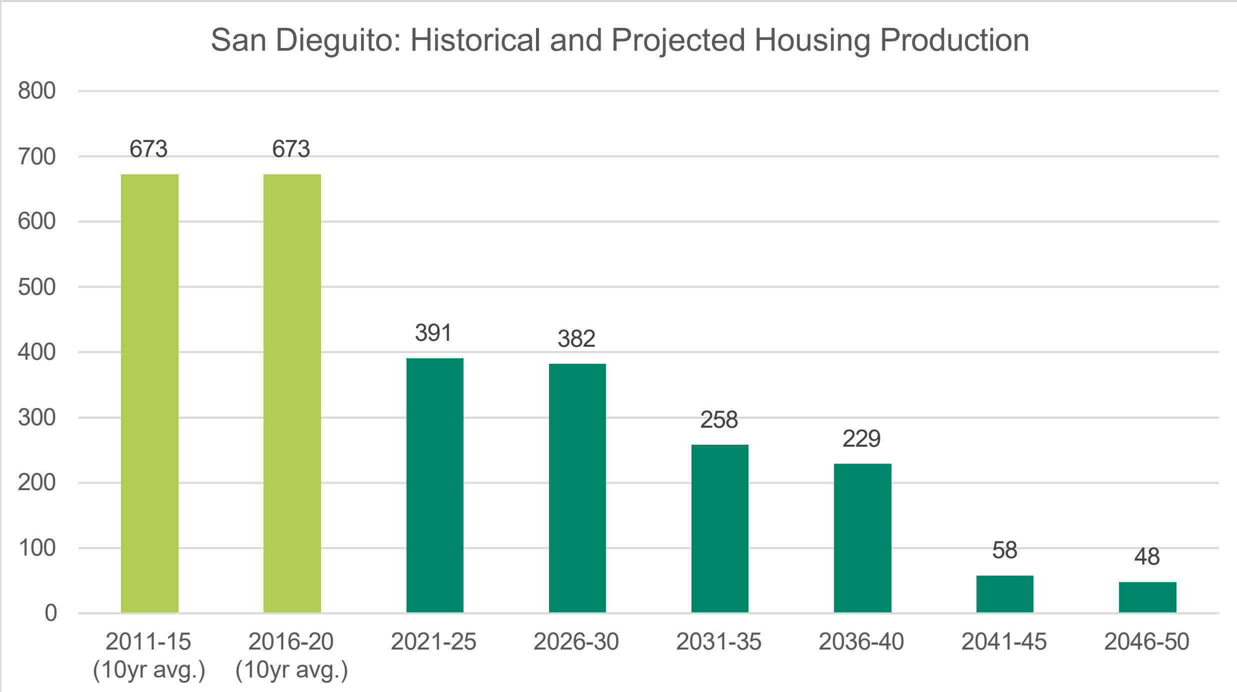
This section uses the San Dieguito CPA to illustrate how estimated housing growth is allocated to each CPA.

In 2021, San Dieguito contributed 13,599 units of housing supply to the unincorporated area. Of these, SPA units are the largest category (8,063 units, 4.5% of the total unincorporated area), followed by single family large lot (4,798, 2.7%), multifamily lower density (341, 0.2%), single family small lot (315, 0.2%), and multifamily higher density (83, 0.05%).

Between 2011 and 2021, San Dieguito added 1,345 units, equivalent to 20.8% of the total growth in the unincorporated area during that time. Of these, SPA units comprised the largest share, totaling 1,047 units and 16.2% of total unincorporated area growth, followed by single family large lot (222, 3.4%), multifamily lower density (57, 0.9%), single family small lot (13, 0.2%), and multifamily higher density (6, 0.1 %).

By applying a 50/50 weighting to both the historical fair share and recent growth trends to estimate capture of total unincorporated area growth, the draft San Dieguito housing forecast yields 1,425 units. However, in two housing categories, forecast growth exceeds the marketable site supply—by 6 units for single-family small lot and 54 units for multifamily lower density. This excess growth potential is redirected to North County Metro, which has marketable site capacity in both categories. After adjusting for these excess units, the final San Dieguito growth forecast totals 1,366 units, which is equivalent to 11.2% of all forecast growth in the unincorporated county area between 2020 and 2050. The resulting sixty-year growth trend for San Dieguito is shown in Figure 8.

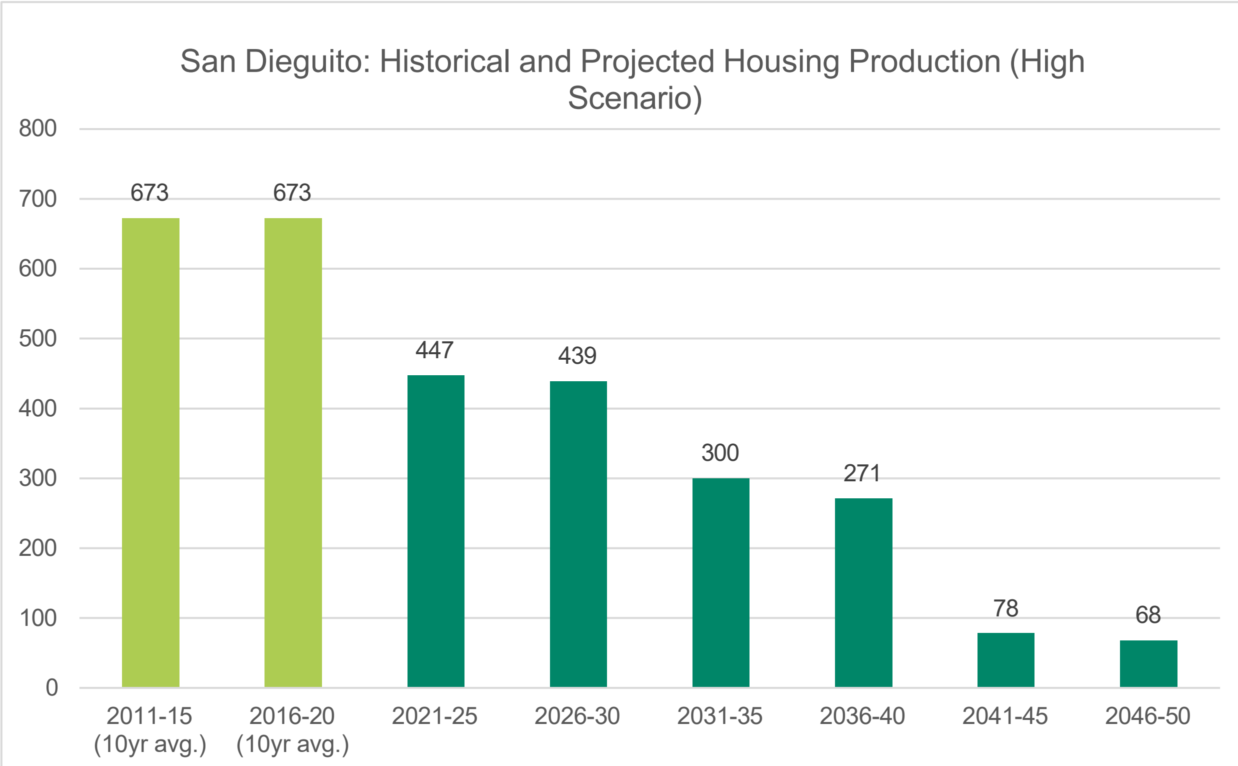
Figure 8. Illustration: Housing Growth Allocation Analysis for San Dieguito CPA (Base estimate)



Source: The County of San Diego, AECOM

Adding the 237 remaining unbuilt SPA units in San Dieguito increases the final San Dieguito growth forecast to 1,603 units in the High estimate, which is equivalent to 7% of all growth in the unincorporated county area between 2020 and 2050. The resulting growth trend for San Dieguito is shown in Figure 9.

Figure 9. Illustration: Housing Growth Allocation Analysis for San Dieguito CPA (High Estimate)



Source: The County of San Diego, AECOM

6. Employment Projections

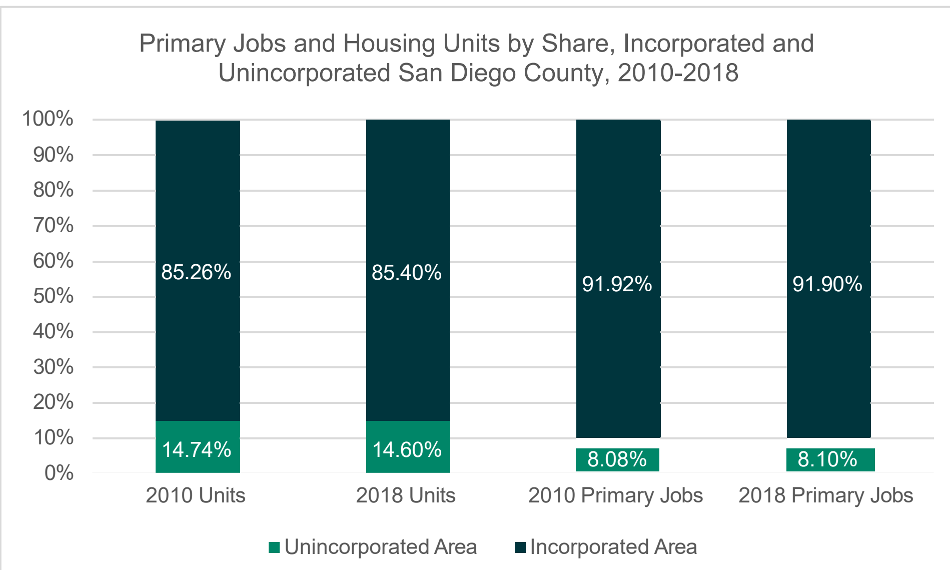
The quantity and location of employment is a meaningful contributor to GHG emissions. To forecast employment growth in the unincorporated county area, AECOM combined two separate analyses. For all CPAs but the Otay CPA, AECOM assumed that employment growth is tied to residential growth and historic ratios of jobs to housing. For Otay, AECOM prepared a separate analysis and referenced recent market research anticipating considerable job growth for the CPA. Both approaches are discussed further below.

(Please note that the employment projections in this report exclude military jobs. Military employment reflects Department of Defense decisions about deployment rather than socioeconomic and regulatory trends. Military employment is overwhelmingly concentrated in Pendleton de Luz CPA. Most statistical agencies exclude non-civilian jobs from their employment forecasts, while SANDAG forecasts static growth in Pendleton de Luz through 2050.)

Employment to Residential Unit Trends

In both 2010 and 2018, as shown in Figure 10, the unincorporated county area contributed approximately 15% of all of San Diego County residential units and 8% of the jobs. The stability of these rates reflects the historical role the unincorporated area has played within the county in supporting residential communities that export workers to concentrated job centers largely outside of the unincorporated area.

Figure 10. County Housing Unit and Jobs Contributions by Area, 2010-2018



Sources: U.S. Census Bureau, SANDAG

However, existing employment in the unincorporated County varies greatly by CPA, as shown in

Table 18. In general, areas with the highest residential development also saw the largest job increases. From 2010 to 2018, total employment in the unincorporated areas of the county grew by approximately 15,000 jobs. A large share of this growth was concentrated in CPAs with larger populations, such as San Dieguito and North County Metro, although rural communities that opened or expanded resort/casinos, such as Barona, Jamul-Dulzura, and Alpine, saw considerable growth as well. Otay, which is discussed further below, also saw considerable growth due to the large warehousing and industrial complex under development there.

Table 18: Historic Employment Growth: 2010- 2018

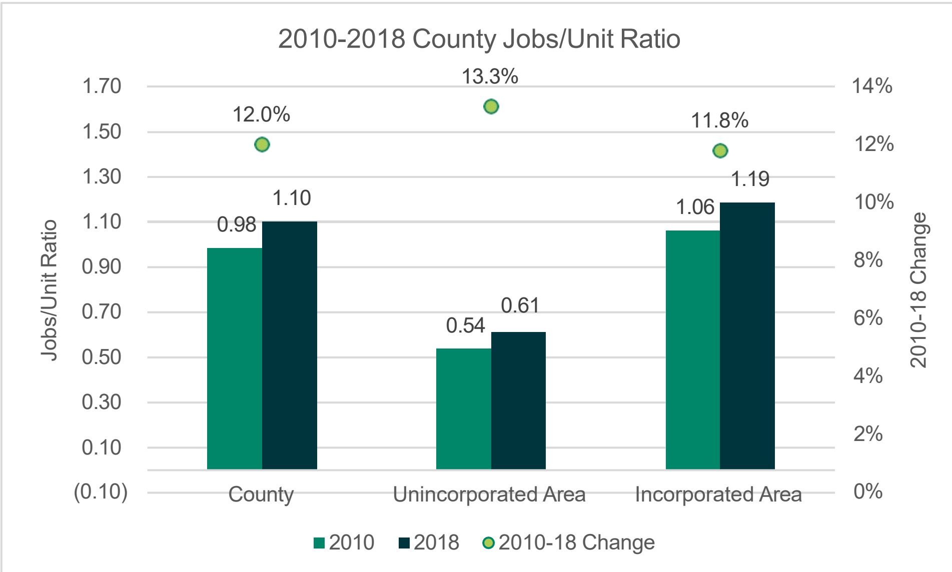
CPA	2018		Growth 2010-18	
	#	Share of Total	#	Annual Rate

Alpine	5,541	5%	1,217	3.1%
Barona	3,046	3%	2,849	40.8%
Bonsall	2,915	3%	57	0.2%
Central Mountain	410	0%	-113	-3.0%
County Islands	180	0%	-279	-11.0%
Crest-Dehesa	3,096	3%	-749	-2.7%
Desert	1,135	1%	-567	-4.9%
Fallbrook	8,263	8%	272	0.4%
Jamul-Dulzura	2,035	2%	826	6.7%
Julian	760	1%	20	0.3%
Lakeside	14,918	14%	171	0.1%
Mountain Empire	1,185	1%	-22	-0.2%
North County Metro	9,552	9%	2,394	3.7%
North Mountain	581	1%	-353	-5.8%
Otay	3,127	3%	1,002	4.9%
Pala-Pauma	5,327	5%	993	2.6%
Pendleton-De Luz	2,083	2%	906	7.4%
Rainbow	1,188	1%	-743	-5.9%
Ramona	5,974	6%	1,149	2.7%
San Dieguito	13,536	13%	3,214	3.4%
Spring Valley	7,887	7%	277	0.4%
Sweetwater	1,839	2%	530	4.3%
Valle De Oro	7,986	7%	1,470	2.6%
Valley Center	4,416	4%	528	1.6%
Total Unincorporated	**106,980**	**100%**	**15,049**	**1.9%**

Source: LEHD

Even with this employment growth in the unincorporated area, the incorporated area still maintained a significantly higher jobs/residential unit ratio. As shown in Figure 11, the incorporated area had a 1.19 jobs/unit ratio in 2018, compared to a 0.61 rate for the unincorporated area. This means that for every unit in the incorporated area, there are 1.19 full-time jobs, compared with 0.61 jobs in the unincorporated area. Also notable is the fact that for both the incorporated and unincorporated areas, the jobs/housing ratio increased, which suggests that San Diego County is importing an increasing number of workers from outside the county and that housing growth is not keeping up.

Figure 11. County Jobs/Unit Ratio 2010-2018



Sources: U.S. Census Bureau, LEHD Origin-Destination Employment Statistics, SANDAG, AECOM

Each CPA varies significantly in the ratio of jobs to housing units, as shown in Table 19, from 0.18 in the rural Central Mountain to 12.48 in Barona, which is driven by the CPA's casino. Table 19 also shows the ratio can fluctuate widely by CPA over time, as new residential developments and employment entities spring up in areas with low existing inventory. However, for the larger CPAs such as Lakeside, Spring Valley, and Fallbrook, the ratios remain more stable over time.

On the basis of this broader observed stability, the employment forecast assumes that for all CPAs excepting Otay, the current jobs/residential unit ratio provides a reasonable basis for forecasting long-term employment growth. For the current ratio, AECOM used the 2020 values shown in Table 19.

Table 19: Jobs/Housing Unit Ratio by CPA: 2010-2020

	2010[1]	2018[1]	2020[2]
Alpine	0.66	0.83	0.83
Barona	0.98	12.48	10.61
Bonsall	0.74	0.72	0.71
Central Mountain	0.24	0.18	0.18
County Islands	0.77	0.30	0.27
Crest-Dehesa	1.08	0.85	0.83
Desert	0.48	0.31	0.32
Fallbrook	0.50	0.51	0.49
Jamul-Dulzura	0.38	0.62	0.67
Julian	0.43	0.42	0.43
Lakeside	0.53	0.53	0.52
Mountain Empire	0.40	0.39	0.39
North County Metro	0.45	0.60	0.61
North Mountain	0.61	0.36	0.33
Otay	303.57	521.17	521.17
Pala-Pauma	2.20	2.68	2.83
Pendleton-De Luz	0.16	0.28	0.30
Rainbow	2.73	1.60	1.54
Ramona	0.39	0.47	0.47
San Dieguito	0.94	1.06	1.13
Spring Valley	0.37	0.38	0.38
Sweetwater	0.28	0.40	0.42
Valle De Oro	0.42	0.51	0.53
Valley Center	0.59	0.64	0.64
Total Unincorporated	**0.54**	**0.61**	**0.62**

Source: SANDAG, U.S. Census, AECOM

(1) SANDAG for units, U.S. Census Bureau, LEHD Origin-Destination Employment Statistics for primary employment

(2) SANDAG for units, AECOM for employment, based on LEHD 2018 primary employment projected to 2020 using historical 2002-2018 average employment growth per CPA.

Otay Employment Projections

The East Otay Mesa Business Park Specific Plan offers great potential for the expansion of employment and business activities in the Otay CPA. This potential is complemented to a lesser degree by the Specific Plans for The Otay Ranch Resort Village and for Otay Ranch Village 14 and Planning Areas 16/19, which propose a resort and complementary neighborhood commercial and civic uses for the anticipated residential buildout.

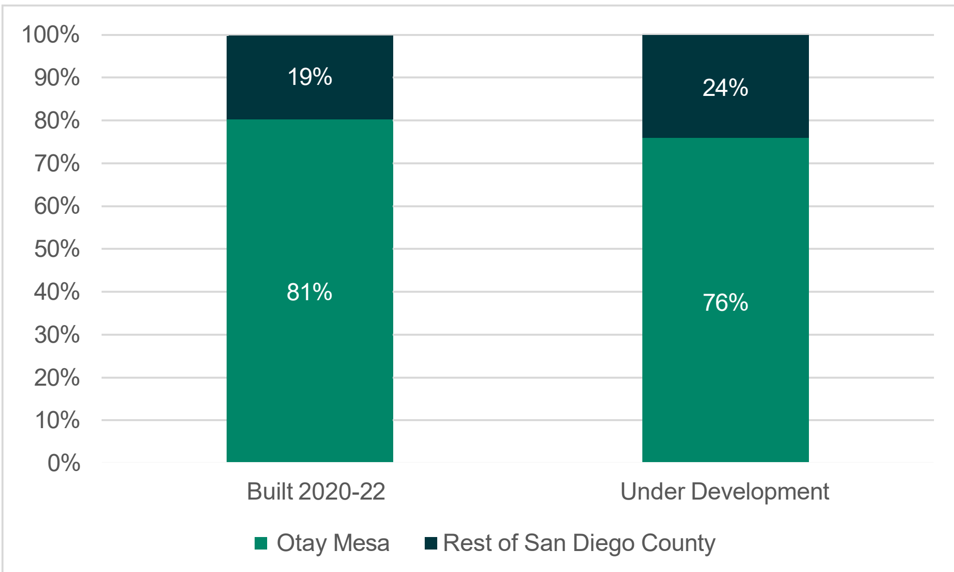
While the Otay CPA has historically hosted little employment outside the operation of detention facilities, the East Otay Mesa Business Park Specific Plan allows for a mix of heavy and light industrial, R&D, office, and other mixed uses[21]. Located east of the Otay Mesa Community Planning Area in the City of San Diego and north of the US-

[21] County of San Diego Otay Mesa Specific Plan https://www.sandiegocounty.gov/content/dam/sdc/pds/advance/specificplans/(3-17-21)%20PDS2020-SPA-20-002%20FINAL.pdf

Mexico Border, the plan has drawn steady and growing interest for industrial land uses, including manufacturing, R&D, warehousing, and logistics.

Proximity to current and proposed border entry points and other major industrial and commercial centers in the incorporated cities, as well as access to well-developed transportation infrastructure make this SPA a highly desirable area for trade-supporting commercial development. The Otay Mesa industrial submarket has seen addition of approximately 5 million square feet of industrial space since 2020, which represents approximately 80 percent of all new industrial space in the San Diego Region. According to CoStar and shown in Figure 10, there are approximately 3.1 million square feet of industrial space in the current development pipeline (proposed and under construction), which is 76 percent of all industrial space under development.

Figure 12: Recent Industrial Growth and Development Pipeline (Square Feet)



Source: CoStar

Amazon opened its largest regional distribution center here in 2021 and now employs over 1,500 workers. Other proposed projects including Otay Crossings, California Crossings, Landmark at Otay, and Majestic Sunroad Center sites. Citing this activity, a market feasibility study by Meyers Research produced in 2020 for the County estimates future demand of between 17.6 million and 24 million square feet of industrial space in the SPA.[22]

Using the Meyers study as a basis, AECOM developed the employment projections shown in Table 20 for the East Otay Mesa Business Park Specific Plan area. To extend the forecast beyond the 20 years assumed by the Meyers study, AECOM applied the same annual absorption rate for years 21 through 30. However, in the High estimate, the forecast industrial build-out exhausts the land area potential for the SPA, and so industrial build-out is capped at the regulatory limit. This results in a Base employment estimate of 14,080 and a High estimate of 14,958[23]. From a land use perspective, the Base estimate uses 73% of the land area (94% of total designated as industrial, 4% of total designated as office/commercial), and the High estimate use 78% (100% of industrial, 6% of office/commercial).

Employment projections for the two other SPAs in the Otay CPA, the Otay Ranch Resort Village Specific Plan and the Otay Ranch Village 14 and Planning Areas 16/19, are also shown in in Table 20. These add employment of 88 in the Base estimate and 281 in the High estimate from a hotel use, a small quantity of neighborhood commercial, and accompanying police and fire department uses. The Base scenario, as with the residential unit projections, assumes a 35% buildout of regulated capacity, and the High scenario a 100% buildout.

[22] Meyers Research and Metro Study, "Assessment of the Most Marketable Uses East Otay Mesa Specific Plan" (2020) https://www.sandiegocounty.gov/content/dam/sdc/pds/ceqa/EOMBusinessParkSPA/Pre-PC/EOMSP%20Market%20Study%20Final.pdf
[23] The original High uncapped industrial forecast yielded estimated employment of 19,448, which would have exceeded the available land area in the SPA designated for industrial use by 30%.

Table 20: Otay CPA Employment Forecast 2020-2050

	Employment Density[1]	Base Estimate[2]	High Estimate[3,4]
East Otay Mesa Business Park Specific Plan			
Industrial[5]			
Heavy Industrial	2,000 sq.ft./FTE	5,144	5,465
Mixed Industrial	2,000 sq.ft./FTE	5,441	5,780
Light Industrial	1,500 sq.ft./FTE	3,495	3,713
Subtotal Industrial		**14,080**	**14,958**
Commercial[5]			
District Commercial	500 sq.ft./FTE	13	19
Technology Business Park	350 sq.ft./FTE	637	963
Subtotal Office and Commercial		**650**	**982**
The Otay Ranch Resort Village Specific Plan			
Commercial and Civic[6]		**64**	**182**
Otay Ranch Village 14 and Planning Areas 16/19			
Commercial and Civic[7]		**24**	**69**
TOTAL		**14,818**	**16,191**

Source: Meyers Research and AECOM

(1) Employment Density assumptions from AECOM, based on recent trends

(2) "Base" industrial and commercial projections based on 20-year annual absorption rate for the “Realistic” scenario forecast by Meyers Research extended for 30 years through 2050.

(3) "High" industrial projections based on 20-year annual absorption rate for the “Optimistic” scenario forecast by Meyers Research but extended for 30 years through 2050 and capped at the SPA designated industrial capacity

(4) "High" office and commercial projections based on 20-year annual absorption rate for the “Optimistic” scenario forecast by Meyers Research extended for 30 years through 2050.

(5) Industrial and Office allocation in proportion with SPA land use designations

(6) Includes 200-key hotel, 20,000 sq.ft. of commercial, 500-student school, police and fire. Base/High at 35%/100% buildout

(7) Includes 10,000 sq.ft. of commercial, 500-student school, police and fire. Base/High at 35%/100% buildout

Final Employment Projections

Combining projections from the Jobs/Unit analysis and the separate Otay analysis yield total estimated employment growth of 21,165 in the Base Scenario and 26,167 in the High Scenario, as shown in Table 21.

Table 21: Final Employment Growth Estimate and Jobs/Housing Unit Ratio by CPA: 2020-2050

	Base		High	
	Primary Jobs	Jobs/Unit Ratio	Primary Jobs	Jobs/Unit Ratio
Alpine	326	0.83	326	0.83
Barona	0	10.61	0	10.61
Bonsall	227	0.71	227	0.71
Central Mountain	18	0.18	18	0.18
County Islands	23	0.27	23	0.27
Crest-Dehesa	158	0.83	158	0.83
Desert	40	0.32	615	0.32
Fallbrook	814	0.49	1,116	0.49
Jamul-Dulzura	169	0.67	1,604	0.67
Julian	47	0.43	47	0.43
Lakeside	776	0.52	946	0.52
Mountain Empire	47	0.39	47	0.39
North County Metro	625	0.61	806	0.61
North Mountain	24	0.33	141	0.33
Otay	14,818	8.56	16,191	3.33
Pala-Pauma	227	2.83	227	2.83
Pendleton-De Luz	0	0.30	0	0.30
Rainbow	28	1.54	28	1.54
Ramona	360	0.47	609	0.47
San Dieguito	1,542	1.13	1,810	1.13
Spring Valley	363	0.38	424	0.38
Sweetwater	61	0.42	61	0.42
Valle De Oro	166	0.53	166	0.53
Valley Center	307	0.64	580	0.64
Total Unincorporated	**21,165**	**0.70**	**26,167**	**0.69**

Source: AECOM

7. Appendix

Military Installations and Tribal Lands

The military population is concentrated in the Pendleton de Luz CPA, where Camp Pendleton is located. The housing projections include the addition of 170 Large Lot Single Family units outside the Camp Pendleton. However, on-base population growth, which occurs solely at the discretion of the Department of Defense, is not included in the population projections.

DoF population projections cover areas in which tribal lands are located. Consequently, the projections include native groups, which are not broken out separately. Likewise, the AECOM population projections also do not treat the tribal population separately from the whole.

Population Projections

Table 22. Cumulative Population by CPA 2020-2050 Base Estimate

Population (Base)	2020-2050 Cumulative by Year							2020-2050 Change		
	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	17,882	18,199	18,505	18,714	18,896	18,942	18,979	1,097	6.1%	0.20%
Barona	771	771	771	771	771	771	771	0	0.0%	0.00%
Bonsall	10,341	10,583	10,821	10,980	11,119	11,152	11,182	841	8.1%	0.26%
Central Mountain	5,497	5,570	5,643	5,690	5,732	5,744	5,751	254	4.6%	0.15%
County Islands	2,040	2,132	2,220	2,278	2,332	2,342	2,352	312	15.3%	0.48%
Crest-Dehesa	10,068	10,228	10,382	10,486	10,577	10,599	10,618	550	5.5%	0.18%
Desert	5,030	5,084	5,137	5,173	5,204	5,211	5,217	187	3.7%	0.12%
Fallbrook	44,212	45,531	46,810	47,676	48,434	48,618	48,772	4,560	10.3%	0.33%
Jamul-Dulzura	9,533	9,753	9,969	10,114	10,240	10,269	10,295	762	8.0%	0.26%
Julian	3,552	3,615	3,676	3,716	3,752	3,762	3,770	218	6.1%	0.20%
Lakeside	75,992	77,202	78,371	79,167	79,860	80,029	80,170	4,178	5.5%	0.18%
Mountain Empire	7,968	8,065	8,158	8,221	8,278	8,291	8,301	333	4.2%	0.14%
North County Metro	44,348	45,197	46,023	46,582	47,072	47,191	47,293	2,945	6.6%	0.21%
North Mountain	3,704	3,753	3,799	3,831	3,858	3,865	3,872	168	4.5%	0.15%
Otay	8,081	8,081	8,460	9,213	10,704	12,520	14,540	6,459	79.9%	1.98%
Pala-Pauma	5,680	5,749	5,814	5,858	5,896	5,907	5,915	235	4.1%	0.14%
Pendleton-De Luz	43,767	43,767	43,767	43,767	43,767	43,767	43,767	0	0.0%	0.00%
Rainbow	2,160	2,175	2,190	2,199	2,208	2,211	2,214	54	2.5%	0.08%
Ramona	35,616	36,262	36,889	37,312	37,682	37,771	37,843	2,227	6.3%	0.20%
San Dieguito	35,534	36,666	37,766	38,504	39,152	39,312	39,443	3,909	11.0%	0.35%
Spring Valley	61,232	62,076	62,894	63,451	63,938	64,057	64,154	2,922	4.8%	0.16%
Sweetwater	12,700	12,824	12,945	13,027	13,099	13,116	13,130	430	3.4%	0.11%
Valle De Oro	41,666	41,921	42,166	42,331	42,478	42,513	42,542	876	2.1%	0.07%
Valley Center	18,301	18,681	19,048	19,298	19,516	19,569	19,613	1,312	7.2%	0.23%
Total	**505,675**	**513,885**	**522,224**	**528,359**	**534,565**	**537,529**	**540,504**	**34,829**	**6.9%**	**0.22%**

Table 23: Incremental Population Growth 2020-2050 in Five-Year Increments Base Estimate

Population (Base)	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	317	306	209	182	46	37	1,097
Barona	0	0	0	0	0	0	0
Bonsall	242	238	159	139	33	30	841
Central Mountain	73	73	47	42	12	7	254
County Islands	92	88	58	54	10	10	312
Crest-Dehesa	160	154	104	91	22	19	550
Desert	54	53	36	31	7	6	187
Fallbrook	1,319	1,279	866	758	184	154	4,560
Jamul-Dulzura	220	216	145	126	29	26	762
Julian	63	61	40	36	10	8	218
Lakeside	1,210	1,169	796	693	169	141	4,178
Mountain Empire	97	93	63	57	13	10	333
North County Metro	849	826	559	490	119	102	2,945
North Mountain	49	46	32	27	7	7	168
Otay	0	379	753	1,491	1,816	2,020	6,459
Pala-Pauma	69	65	44	38	11	8	235
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	15	15	9	9	3	3	54
Ramona	646	627	423	370	89	72	2,227
San Dieguito	1,132	1,100	738	648	160	131	3,909
Spring Valley	844	818	557	487	119	97	2,922
Sweetwater	124	121	82	72	17	14	430
Valle De Oro	255	245	165	147	35	29	876
Valley Center	380	367	250	218	53	44	1,312
Total	**8,210**	**8,339**	**6,135**	**6,206**	**2,964**	**2,975**	**34,829**

Table 24. Cumulative Population by CPA 2020-2050 High Estimate

Population (High)	2020-2050 Cumulative by Year							2020-2050 Change		
	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	17,882	18,199	18,505	18,714	18,896	18,942	18,979	1,097	6.1%	0.20%
Barona	771	771	771	771	771	771	771	0	0.0%	0.00%
Bonsall	10,341	10,583	10,821	10,980	11,119	11,152	11,182	841	8.1%	0.26%
Central Mountain	5,497	5,570	5,643	5,690	5,732	5,744	5,751	254	4.6%	0.15%
County Islands	2,040	2,132	2,220	2,278	2,332	2,342	2,352	312	15.3%	0.48%
Crest-Dehesa	10,068	10,228	10,382	10,486	10,577	10,599	10,618	550	5.5%	0.18%
Desert	5,030	5,721	6,419	6,927	7,431	7,660	7,887	2,857	56.8%	1.51%
Fallbrook	44,212	45,932	47,614	48,776	49,832	50,155	50,449	6,237	14.1%	0.44%
Jamul-Dulzura	9,533	11,287	13,056	14,338	15,606	16,169	16,725	7,192	75.4%	1.89%
Julian	3,552	3,615	3,676	3,716	3,752	3,762	3,770	218	6.1%	0.20%
Lakeside	75,992	77,419	78,807	79,764	80,619	80,864	81,080	5,088	6.7%	0.22%
Mountain Empire	7,968	8,065	8,158	8,221	8,278	8,291	8,301	333	4.2%	0.14%
North County Metro	44,348	45,401	46,433	47,141	47,782	47,971	48,145	3,797	8.6%	0.27%
North Mountain	3,704	3,949	4,195	4,372	4,545	4,621	4,694	990	26.7%	0.79%
Otay	8,081	10,861	14,053	16,867	20,427	23,208	26,191	18,110	224.1%	4.00%
Pala-Pauma	5,680	5,749	5,814	5,858	5,896	5,907	5,915	235	4.1%	0.14%
Pendleton-De Luz	43,767	43,767	43,767	43,767	43,767	43,767	43,767	0	0.0%	0.00%
Rainbow	2,160	2,175	2,190	2,199	2,208	2,211	2,214	54	2.5%	0.08%
Ramona	35,616	36,628	37,626	38,321	38,963	39,181	39,378	3,762	10.6%	0.34%
San Dieguito	35,534	36,828	38,092	38,950	39,717	39,932	40,118	4,584	12.9%	0.41%
Spring Valley	61,232	62,192	63,128	63,771	64,343	64,500	64,636	3,404	5.6%	0.18%
Sweetwater	12,700	12,824	12,945	13,027	13,099	13,116	13,130	430	3.4%	0.11%
Valle De Oro	41,666	41,921	42,166	42,331	42,478	42,513	42,542	876	2.1%	0.07%
Valley Center	18,301	18,957	19,604	20,059	20,482	20,632	20,775	2,474	13.5%	0.42%
Total	505,675	520,774	536,085	547,324	558,652	564,010	569,370	63,695	12.6%	0.40%

Table 25: Incremental Population Growth 2020-2050 in Five-Year Increments High Estimate

Population (High)	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	317	306	209	182	46	37	1,097
Barona	0	0	0	0	0	0	0
Bonsall	242	238	159	139	33	30	841
Central Mountain	73	73	47	42	12	7	254
County Islands	92	88	58	54	10	10	312
Crest-Dehesa	160	154	104	91	22	19	550
Desert	691	698	508	504	229	227	2,857
Fallbrook	1,720	1,682	1,162	1,056	323	294	6,237
Jamul-Dulzura	1,754	1,769	1,282	1,268	563	556	7,192
Julian	63	61	40	36	10	8	218
Lakeside	1,427	1,388	957	855	245	216	5,088
Mountain Empire	97	93	63	57	13	10	333
North County Metro	1,053	1,032	708	641	189	174	3,797
North Mountain	245	246	177	173	76	73	990
Otay	2,780	3,192	2,814	3,560	2,781	2,983	18,110
Pala-Pauma	69	65	44	38	11	8	235
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	15	15	9	9	3	3	54
Ramona	1,012	998	695	642	218	197	3,762
San Dieguito	1,294	1,264	858	767	215	186	4,584
Spring Valley	960	936	643	572	157	136	3,404
Sweetwater	124	121	82	72	17	14	430
Valle De Oro	255	245	165	147	35	29	876
Valley Center	656	647	455	423	150	143	2,474
Total	**15,099**	**15,311**	**11,239**	**11,328**	**5,358**	**5,360**	**63,695**

Residential Projections

All Units

Table 26. Cumulative Residential Growth by CPA 2020-2050 Base Estimate

Residential (Base)			2020-2050 Cumulative by Year					2020-2050 Change		
All Units	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	6,721	6,833	6,942	7,017	7,083	7,100	7,114	393	5.8%	0.19%
Barona	287	287	287	287	287	287	287	0	0.0%	0.00%
Bonsall	4,088	4,178	4,267	4,327	4,380	4,393	4,405	317	7.8%	0.25%
Central Mountain	2,318	2,347	2,376	2,395	2,412	2,417	2,420	102	4.4%	0.14%
County Islands	591	616	640	656	671	674	677	86	14.6%	0.45%
Crest-Dehesa	3,671	3,726	3,779	3,815	3,847	3,855	3,862	191	5.2%	0.17%
Desert	3,540	3,576	3,611	3,635	3,656	3,661	3,665	125	3.5%	0.12%
Fallbrook	16,765	17,236	17,695	18,008	18,285	18,354	18,412	1,647	9.8%	0.31%
Jamul-Dulzura	3,308	3,380	3,451	3,499	3,541	3,551	3,560	252	7.6%	0.25%
Julian	1,843	1,874	1,904	1,924	1,942	1,947	1,951	108	5.9%	0.19%
Lakeside	28,228	28,651	29,062	29,344	29,592	29,654	29,706	1,478	5.2%	0.17%
Mountain Empire	3,064	3,099	3,133	3,156	3,177	3,182	3,186	122	4.0%	0.13%
North County Metro	16,154	16,445	16,730	16,924	17,096	17,139	17,176	1,022	6.3%	0.20%
North Mountain	1,686	1,707	1,727	1,741	1,753	1,756	1,759	73	4.3%	0.14%
Otay	6	6	131	381	881	1,506	2,206	2,200	36666.7%	21.76%
Pala-Pauma	2,021	2,044	2,066	2,081	2,094	2,098	2,101	80	4.0%	0.13%
Pendleton-De Luz	7,560	7,560	7,560	7,560	7,560	7,560	7,560	0	0.0%	0.00%
Rainbow	747	752	757	760	763	764	765	18	2.4%	0.08%
Ramona	12,892	13,112	13,327	13,473	13,602	13,634	13,660	768	6.0%	0.19%
San Dieguito	13,036	13,427	13,809	14,067	14,296	14,354	14,402	1,366	10.5%	0.33%
Spring Valley	20,874	21,145	21,409	21,590	21,750	21,790	21,823	949	4.5%	0.15%
Sweetwater	4,553	4,595	4,636	4,664	4,689	4,695	4,700	147	3.2%	0.11%
Valle De Oro	15,606	15,696	15,783	15,842	15,895	15,908	15,919	313	2.0%	0.07%
Valley Center	7,051	7,189	7,323	7,415	7,496	7,516	7,533	482	6.8%	0.22%
Total	176,610	179,481	182,405	184,561	186,748	187,795	188,849	12,239	6.9%	0.22%

Table 27: Incremental Residential Growth 2020-2050 in Five-Year Increments Base Estimate

Residential (Base) *All Units*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	112	109	75	66	17	14	393
Barona	0	0	0	0	0	0	0
Bonsall	90	89	60	53	13	12	317
Central Mountain	29	29	19	17	5	3	102
County Islands	25	24	16	15	3	3	86
Crest-Dehesa	55	53	36	32	8	7	191
Desert	36	35	24	21	5	4	125
Fallbrook	471	459	313	277	69	58	1,647
Jamul-Dulzura	72	71	48	42	10	9	252
Julian	31	30	20	18	5	4	108
Lakeside	423	411	282	248	62	52	1,478
Mountain Empire	35	34	23	21	5	4	122
North County Metro	291	285	194	172	43	37	1,022
North Mountain	21	20	14	12	3	3	73
Otay	0	125	250	500	625	700	2,200
Pala-Pauma	23	22	15	13	4	3	80
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	5	5	3	3	1	1	18
Ramona	220	215	146	129	32	26	768
San Dieguito	391	382	258	229	58	48	1,366
Spring Valley	271	264	181	160	40	33	949
Sweetwater	42	41	28	25	6	5	147
Valle De Oro	90	87	59	53	13	11	313
Valley Center	138	134	92	81	20	17	482
Total	**2,871**	**2,924**	**2,156**	**2,187**	**1,047**	**1,054**	**12,239**

Table 28. Cumulative Residential Growth by CPA 2020-2050 High Estimate

Residential (High)	2020-2050 Cumulative by Year							2020-2050 Change		
All Units	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	6,721	6,833	6,942	7,017	7,083	7,100	7,114	393	5.8%	0.19%
Barona	287	287	287	287	287	287	287	0	0.0%	0.00%
Bonsall	4,088	4,178	4,267	4,327	4,380	4,393	4,405	317	7.8%	0.25%
Central Mountain	2,318	2,347	2,376	2,395	2,412	2,417	2,420	102	4.4%	0.14%
County Islands	591	616	640	656	671	674	677	86	14.6%	0.45%
Crest-Dehesa	3,671	3,726	3,779	3,815	3,847	3,855	3,862	191	5.2%	0.17%
Desert	3,540	3,998	4,463	4,804	5,146	5,305	5,464	1,924	54.4%	1.46%
Fallbrook	16,765	17,379	17,983	18,403	18,789	18,910	19,021	2,256	13.5%	0.42%
Jamul-Dulzura	3,308	3,881	4,462	4,886	5,310	5,503	5,695	2,387	72.2%	1.83%
Julian	1,843	1,874	1,904	1,924	1,942	1,947	1,951	108	5.9%	0.19%
Lakeside	28,228	28,727	29,215	29,554	29,860	29,950	30,030	1,802	6.4%	0.21%
Mountain Empire	3,064	3,099	3,133	3,156	3,177	3,182	3,186	122	4.0%	0.13%
North County Metro	16,154	16,515	16,871	17,117	17,342	17,410	17,473	1,319	8.2%	0.26%
North Mountain	1,686	1,791	1,897	1,974	2,050	2,084	2,117	431	25.6%	0.76%
Otay	6	917	1,969	2,903	4,097	5,054	6,088	6,082	10136%	25.95%
Pala-Pauma	2,021	2,044	2,066	2,081	2,094	2,098	2,101	80	4.0%	0.13%
Pendleton-De Luz	7,560	7,560	7,560	7,560	7,560	7,560	7,560	0	0.0%	0.00%
Rainbow	747	752	757	760	763	764	765	18	2.4%	0.08%
Ramona	12,892	13,237	13,579	13,819	14,043	14,121	14,192	1,300	10.1%	0.32%
San Dieguito	13,036	13,483	13,922	14,222	14,493	14,571	14,639	1,603	12.3%	0.39%
Spring Valley	20,874	21,182	21,484	21,693	21,881	21,934	21,980	1,106	5.3%	0.17%
Sweetwater	4,553	4,595	4,636	4,664	4,689	4,695	4,700	147	3.2%	0.11%
Valle De Oro	15,606	15,696	15,783	15,842	15,895	15,908	15,919	313	2.0%	0.07%
Valley Center	7,051	7,289	7,525	7,692	7,849	7,906	7,961	910	12.9%	0.41%
Total	**176,610**	**182,006**	**187,500**	**191,551**	**195,660**	**197,628**	**199,607**	**22,997**	**13.0%**	**0.41%**

Table 29: Incremental Residential Growth 2020-2050 in Five-Year Increments High Estimate

Residential (High) *All Units*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	112	109	75	66	17	14	393
Barona	0	0	0	0	0	0	0
Bonsall	90	89	60	53	13	12	317
Central Mountain	29	29	19	17	5	3	102
County Islands	25	24	16	15	3	3	86
Crest-Dehesa	55	53	36	32	8	7	191
Desert	458	465	341	342	159	159	1,924
Fallbrook	614	604	420	386	121	111	2,256
Jamul-Dulzura	573	581	424	424	193	192	2,387
Julian	31	30	20	18	5	4	108
Lakeside	499	488	339	306	90	80	1,802
Mountain Empire	35	34	23	21	5	4	122
North County Metro	361	356	246	225	68	63	1,319
North Mountain	105	106	77	76	34	33	431
Otay	911	1,052	934	1,194	957	1,034	6,082
Pala-Pauma	23	22	15	13	4	3	80
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	5	5	3	3	1	1	18
Ramona	345	342	240	224	78	71	1,300
San Dieguito	447	439	300	271	78	68	1,603
Spring Valley	308	302	209	188	53	46	1,106
Sweetwater	42	41	28	25	6	5	147
Valle De Oro	90	87	59	53	13	11	313
Valley Center	238	236	167	157	57	55	910
Total	**5,396**	**5,494**	**4,051**	**4,109**	**1,968**	**1,979**	**22,997**

Single Family Large Lot (<VR 2)

Table 30. Cumulative Residential Growth by CPA 2020-2050 Base and High Estimates

Residential (Base & High)	2020-2050 Cumulative by Year							2020-2050 Change		
SF Large Lot (<VR 2)	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	4,754	4,833	4,910	4,963	5,010	5,022	5,032	278	5.8%	0.19%
Barona	287	287	287	287	287	287	287	0	0.0%	0.00%
Bonsall	2,832	2,903	2,973	3,020	3,062	3,072	3,081	249	8.8%	0.28%
Central Mountain	2,054	2,079	2,104	2,121	2,136	2,140	2,143	89	4.3%	0.14%
County Islands	0	0	0	0	0	0	0	0	NA	NA
Crest-Dehesa	3,314	3,369	3,422	3,458	3,490	3,498	3,505	191	5.8%	0.19%
Desert	2,278	2,301	2,323	2,338	2,351	2,354	2,357	79	3.5%	0.11%
Fallbrook	9,020	9,233	9,441	9,583	9,708	9,739	9,765	745	8.3%	0.26%
Jamul-Dulzura	3,289	3,340	3,390	3,424	3,454	3,461	3,467	178	5.4%	0.18%
Julian	1,747	1,778	1,808	1,828	1,846	1,851	1,855	108	6.2%	0.20%
Lakeside	3,660	3,722	3,782	3,823	3,859	3,868	3,876	216	5.9%	0.19%
Mountain Empire	2,687	2,722	2,756	2,779	2,800	2,805	2,809	122	4.5%	0.15%
North County Metro	3,414	3,516	3,616	3,684	3,744	3,759	3,772	358	10.5%	0.33%
North Mountain	1,686	1,707	1,727	1,741	1,753	1,756	1,759	73	4.3%	0.14%
Otay	0	0	0	0	0	0	0	0	NA	NA
Pala-Pauma	1,437	1,455	1,472	1,484	1,494	1,497	1,499	62	4.3%	0.14%
Pendleton-De Luz	7,560	7,560	7,560	7,560	7,560	7,560	7,560	0	0.0%	0.00%
Rainbow	617	622	627	630	633	634	635	18	2.9%	0.10%
Ramona	5,953	6,089	6,222	6,312	6,392	6,412	6,429	476	8.0%	0.26%
San Dieguito	4,599	4,687	4,773	4,831	4,883	4,896	4,907	308	6.7%	0.22%
Spring Valley	954	971	988	999	1,009	1,011	1,013	59	6.2%	0.20%
Sweetwater	2,980	3,012	3,043	3,064	3,083	3,088	3,092	112	3.8%	0.12%
Valle De Oro	6,799	6,869	6,937	6,983	7,024	7,034	7,043	244	3.6%	0.12%
Valley Center	6,683	6,806	6,926	7,008	7,080	7,098	7,113	430	6.4%	0.21%
Total	**78,604**	**79,861**	**81,087**	**81,920**	**82,658**	**82,842**	**82,999**	**4,395**	**5.6%**	**0.18%**

Table 31: Incremental Residential Growth Single Family Large Lot 2020-2050 in Five-Year Increments Base and High Estimates

Residential(Base, High) *(<VR 2)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	79	77	53	47	12	10	278
Barona	0	0	0	0	0	0	0
Bonsall	71	70	47	42	10	9	249
Central Mountain	25	25	17	15	4	3	89
County Islands	0	0	0	0	0	0	0
Crest-Dehesa	55	53	36	32	8	7	191
Desert	23	22	15	13	3	3	79
Fallbrook	213	208	142	125	31	26	745
Jamul-Dulzura	51	50	34	30	7	6	178
Julian	31	30	20	18	5	4	108
Lakeside	62	60	41	36	9	8	216
Mountain Empire	35	34	23	21	5	4	122
North County Metro	102	100	68	60	15	13	358
North Mountain	21	20	14	12	3	3	73
Otay	0	0	0	0	0	0	0
Pala-Pauma	18	17	12	10	3	2	62
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	5	5	3	3	1	1	18
Ramona	136	133	90	80	20	17	476
San Dieguito	88	86	58	52	13	11	308
Spring Valley	17	17	11	10	2	2	59
Sweetwater	32	31	21	19	5	4	112
Valle De Oro	70	68	46	41	10	9	244
Valley Center	123	120	82	72	18	15	430
Total	**1,257**	**1,226**	**833**	**738**	**184**	**157**	**4,395**

Single Family Small Lot (VR 2 to VR 7.3)

Table 32. Cumulative Residential Growth by CPA Single Family Small Lot 2020-2050 Base and High Estimate

Residential (Base & High)	2020-2050 Cumulative by Year							2020-2050 Change		
SF Small Lot (VR 2-7.3)	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	136	143	150	155	159	160	161	25	18.4%	0.56%
Barona	0	0	0	0	0	0	0	0	NA	NA
Bonsall	359	374	389	399	408	410	412	53	14.8%	0.46%
Central Mountain	264	268	272	274	276	277	277	13	4.9%	0.16%
County Islands	564	569	574	577	580	581	582	18	3.2%	0.10%
Crest-Dehesa	0	0	0	0	0	0	0	0	NA	NA
Desert	815	825	835	842	848	850	851	36	4.4%	0.14%
Fallbrook	2,139	2,169	2,198	2,218	2,236	2,240	2,244	105	4.9%	0.16%
Jamul-Dulzura	0	0	0	0	0	0	0	0	NA	NA
Julian	96	96	96	96	96	96	96	0	0.0%	0.00%
Lakeside	9,491	9,612	9,730	9,811	9,882	9,900	9,915	424	4.5%	0.15%
Mountain Empire	353	353	353	353	353	353	353	0	0.0%	0.00%
North County Metro	1,515	1,545	1,574	1,594	1,612	1,616	1,620	105	6.9%	0.22%
North Mountain	0	0	0	0	0	0	0	0	NA	NA
Otay	0	0	0	0	0	0	0	0	NA	NA
Pala-Pauma	584	589	594	597	600	601	602	18	3.1%	0.10%
Pendleton-De Luz	0	0	0	0	0	0	0	0	NA	NA
Rainbow	130	130	130	130	130	130	130	0	0.0%	0.00%
Ramona	5,562	5,612	5,661	5,694	5,723	5,730	5,736	174	3.1%	0.10%
San Dieguito	302	306	310	312	314	315	315	13	4.3%	0.14%
Spring Valley	11,612	11,726	11,837	11,913	11,980	11,997	12,011	399	3.4%	0.11%
Sweetwater	1,013	1,023	1,033	1,040	1,046	1,047	1,048	35	3.5%	0.11%
Valle De Oro	2,256	2,276	2,295	2,308	2,320	2,323	2,325	69	3.1%	0.10%
Valley Center	17	17	17	17	17	17	17	0	0.0%	0.00%
Total	**37,209**	**37,634**	**38,049**	**38,331**	**38,581**	**38,644**	**38,696**	**1,487**	**4.0%**	**0.13%**

Table 33: Incremental Residential Growth 2020-2050 Single Family Small Lot in Five-Year Increments Base and High Estimate

Residential(Base, High) *(VR 2-7.3)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	7	7	5	4	1	1	25
Barona	0	0	0	0	0	0	0
Bonsall	15	15	10	9	2	2	53
Central Mountain	4	4	2	2	1	0	13
County Islands	5	5	3	3	1	1	18
Crest-Dehesa	0	0	0	0	0	0	0
Desert	10	10	7	6	2	1	36
Fallbrook	30	29	20	18	4	4	105
Jamul-Dulzura	0	0	0	0	0	0	0
Julian	0	0	0	0	0	0	0
Lakeside	121	118	81	71	18	15	424
Mountain Empire	0	0	0	0	0	0	0
North County Metro	30	29	20	18	4	4	105
North Mountain	0	0	0	0	0	0	0
Otay	0	0	0	0	0	0	0
Pala-Pauma	5	5	3	3	1	1	18
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	0	0	0	0	0	0	0
Ramona	50	49	33	29	7	6	174
San Dieguito	4	4	2	2	1	0	13
Spring Valley	114	111	76	67	17	14	399
Sweetwater	10	10	7	6	1	1	35
Valle De Oro	20	19	13	12	3	2	69
Valley Center	0	0	0	0	0	0	0
Total	**425**	**415**	**282**	**250**	**63**	**52**	**1,487**

Multifamily Lower Density (VR 7.3 – VR 15)

Table 34. Cumulative Residential Growth Multifamily Lower Density by CPA 2020-2050 Base and High Estimate

Residential (Base & High)	2020-2050 Cumulative by Year							2020-2050 Change		
MF Lower Density (VR 7.3 - 15)	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	1,042	1,062	1,081	1,094	1,106	1,109	1,111	69	6.6%	0.21%
Barona	0	0	0	0	0	0	0	0	NA	NA
Bonsall	396	400	404	407	409	410	411	15	3.8%	0.12%
Central Mountain	0	0	0	0	0	0	0	0	NA	NA
County Islands	12	15	18	20	22	22	22	10	85.2%	2.07%
Crest-Dehesa	0	0	0	0	0	0	0	0	NA	NA
Desert	114	114	114	114	114	114	114	0	0.0%	0.00%
Fallbrook	1,010	1,022	1,034	1,042	1,049	1,051	1,053	43	4.3%	0.14%
Jamul-Dulzura	0	0	0	0	0	0	0	0	NA	NA
Julian	0	0	0	0	0	0	0	0	NA	NA
Lakeside	7,567	7,713	7,855	7,952	8,038	8,059	8,077	510	6.7%	0.22%
Mountain Empire	21	21	21	21	21	21	21	0	0.0%	0.00%
North County Metro	331	364	396	418	437	442	446	115	34.8%	1.00%
North Mountain	0	0	0	0	0	0	0	0	NA	NA
Otay	0	0	0	0	0	0	0	0	NA	NA
Pala-Pauma	0	0	0	0	0	0	0	0	NA	NA
Pendleton-De Luz	0	0	0	0	0	0	0	0	NA	NA
Rainbow	0	0	0	0	0	0	0	0	NA	NA
Ramona	443	455	466	474	481	483	484	41	9.2%	0.30%
San Dieguito	327	327	327	327	327	327	327	0	0.0%	0.00%
Spring Valley	4,643	4,707	4,769	4,812	4,850	4,859	4,867	224	4.8%	0.16%
Sweetwater	0	0	0	0	0	0	0	0	NA	NA
Valle De Oro	182	182	182	182	182	182	182	0	0.0%	0.00%
Valley Center	0	6	12	16	20	21	22	22	NA	NA
Total	**16,089**	**16,389**	**16,680**	**16,880**	**17,057**	**17,101**	**17,138**	**1,049**	**6.5%**	**0.21%**

Table 35: Incremental Residential Growth 2020-2050 Multifamily Lower Density in Five-Year Increments Base and High Estimate

Residential(Base, High) *(VR 7.3-15)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	20	19	13	12	3	2	69
Barona	0	0	0	0	0	0	0
Bonsall	4	4	3	2	1	1	15
Central Mountain	0	0	0	0	0	0	0
County Islands	3	3	2	2	0	0	10
Crest-Dehesa	0	0	0	0	0	0	0
Desert	0	0	0	0	0	0	0
Fallbrook	12	12	8	7	2	2	43
Jamul-Dulzura	0	0	0	0	0	0	0
Julian	0	0	0	0	0	0	0
Lakeside	146	142	97	86	21	18	510
Mountain Empire	0	0	0	0	0	0	0
North County Metro	33	32	22	19	5	4	115
North Mountain	0	0	0	0	0	0	0
Otay	0	0	0	0	0	0	0
Pala-Pauma	0	0	0	0	0	0	0
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	0	0	0	0	0	0	0
Ramona	12	11	8	7	2	1	41
San Dieguito	0	0	0	0	0	0	0
Spring Valley	64	62	43	38	9	8	224
Sweetwater	0	0	0	0	0	0	0
Valle De Oro	0	0	0	0	0	0	0
Valley Center	6	6	4	4	1	1	22
Total	**300**	**291**	**200**	**177**	**44**	**37**	**1,049**

Multifamily Higher Density (VR 15 – VR 30)

Table 36. Cumulative Residential Growth Multifamily Higher Density by CPA 2020-2050 Base and High Estimate

Residential (Base & High)	2020-2050 Cumulative by Year							2020-2050 Change		
MF Higher Density (VR 15-30)	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	659	665	671	675	678	679	680	21	3.2%	0.10%
Barona	0	0	0	0	0	0	0	0	NA	NA
Bonsall	0	0	0	0	0	0	0	0	NA	NA
Central Mountain	0	0	0	0	0	0	0	0	NA	NA
County Islands	16	33	49	60	70	72	74	58	370.5%	5.30%
Crest-Dehesa	0	0	0	0	0	0	0	0	NA	NA
Desert	0	0	0	0	0	0	0	0	NA	NA
Fallbrook	2,434	2,460	2,485	2,502	2,517	2,521	2,524	90	3.7%	0.12%
Jamul-Dulzura	0	0	0	0	0	0	0	0	NA	NA
Julian	0	0	0	0	0	0	0	0	NA	NA
Lakeside	6,258	6,324	6,388	6,432	6,471	6,481	6,489	231	3.7%	0.12%
Mountain Empire	0	0	0	0	0	0	0	0	NA	NA
North County Metro	405	418	431	440	448	450	452	47	11.6%	0.37%
North Mountain	0	0	0	0	0	0	0	0	NA	NA
Otay	0	0	0	0	0	0	0	0	NA	NA
Pala-Pauma	0	0	0	0	0	0	0	0	NA	NA
Pendleton-De Luz	0	0	0	0	0	0	0	0	NA	NA
Rainbow	0	0	0	0	0	0	0	0	NA	NA
Ramona	591	610	629	642	653	656	658	67	11.3%	0.36%
San Dieguito	80	82	84	85	86	86	86	6	7.5%	0.24%
Spring Valley	2,774	2,798	2,821	2,837	2,851	2,855	2,858	84	3.0%	0.10%
Sweetwater	560	560	560	560	560	560	560	0	0.0%	0.00%
Valle De Oro	1,362	1,362	1,362	1,362	1,362	1,362	1,362	0	0.0%	0.00%
Valley Center	50	52	53	54	55	55	55	5	10.0%	0.32%
Total	**15,189**	**15,364**	**15,533**	**15,649**	**15,751**	**15,777**	**15,798**	**609**	**4.0%**	**0.13%**

Table 37: Incremental Residential Growth 2020-2050 in Five-Year Increments Base and High Estimate

Residential(Base, High) *(VR 15-30)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	6	6	4	3	1	1	21
Barona	0	0	0	0	0	0	0
Bonsall	0	0	0	0	0	0	0
Central Mountain	0	0	0	0	0	0	0
County Islands	17	16	11	10	2	2	58
Crest-Dehesa	0	0	0	0	0	0	0
Desert	0	0	0	0	0	0	0
Fallbrook	26	25	17	15	4	3	90
Jamul-Dulzura	0	0	0	0	0	0	0
Julian	0	0	0	0	0	0	0
Lakeside	66	64	44	39	10	8	231
Mountain Empire	0	0	0	0	0	0	0
North County Metro	13	13	9	8	2	2	47
North Mountain	0	0	0	0	0	0	0
Otay	0	0	0	0	0	0	0
Pala-Pauma	0	0	0	0	0	0	0
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	0	0	0	0	0	0	0
Ramona	19	19	13	11	3	2	67
San Dieguito	2	2	1	1	0	0	6
Spring Valley	24	23	16	14	4	3	84
Sweetwater	0	0	0	0	0	0	0
Valle De Oro	0	0	0	0	0	0	0
Valley Center	2	1	1	1	0	0	5
Total	**175**	**169**	**116**	**102**	**26**	**21**	**609**

SPA

Table 38. Cumulative SPA Residential Growth by CPA 2020-2050 Base Estimate

Residential (Base)	2020-2050 Cumulative by Year							2020-2050 Change		
SPA	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	130	130	130	130	130	130	130	0	0.0%	0.00%
Barona	0	0	0	0	0	0	0	0	NA	NA
Bonsall	500	500	500	500	500	500	500	0	0.0%	0.00%
Central Mountain	0	0	0	0	0	0	0	0	NA	NA
County Islands	0	0	0	0	0	0	0	0	NA	NA
Crest-Dehesa	357	357	357	357	357	357	357	0	0.0%	0.00%
Desert	333	336	339	341	343	343	343	10	3.0%	0.10%
Fallbrook	2,161	2,351	2,536	2,662	2,774	2,802	2,825	664	30.7%	0.90%
Jamul-Dulzura	19	40	61	75	87	90	93	74	383.0%	5.39%
Julian	0	0	0	0	0	0	0	0	NA	NA
Lakeside	1,252	1,280	1,307	1,326	1,342	1,346	1,349	97	7.7%	0.25%
Mountain Empire	3	3	3	3	3	3	3	0	0.0%	0.00%
North County Metro	10,490	10,603	10,714	10,789	10,856	10,873	10,887	397	3.8%	0.12%
North Mountain	0	0	0	0	0	0	0	0	NA	NA
Otay	6	6	131	381	881	1,506	2,206	2,200	36667%	21.76%
Pala-Pauma	0	0	0	0	0	0	0	0	NA	NA
Pendleton-De Luz	0	0	0	0	0	0	0	0	NA	NA
Rainbow	0	0	0	0	0	0	0	0	NA	NA
Ramona	343	346	349	351	353	353	353	10	2.9%	0.10%
San Dieguito	7,729	8,026	8,316	8,513	8,687	8,731	8,768	1,039	13.4%	0.42%
Spring Valley	890	942	993	1,028	1,059	1,067	1,073	183	20.6%	0.63%
Sweetwater	0	0	0	0	0	0	0	0	NA	NA
Valle De Oro	5,005	5,005	5,005	5,005	5,005	5,005	5,005	0	0.0%	0.00%
Valley Center	301	308	315	320	324	325	326	25	8.3%	0.27%
Total	**29,520**	**30,234**	**31,057**	**31,782**	**32,702**	**33,432**	**34,219**	**4,699**	**15.9%**	**0.49%**

Table 39: Incremental Residential SPA Growth 2020-2050 in Five-Year Increments Base Estimate

Residential (Base) *(SPA)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	0	0	0	0	0	0	0
Barona	0	0	0	0	0	0	0
Bonsall	0	0	0	0	0	0	0
Central Mountain	0	0	0	0	0	0	0
County Islands	0	0	0	0	0	0	0
Crest-Dehesa	0	0	0	0	0	0	0
Desert	3	3	2	2	0	0	10
Fallbrook	190	185	126	112	28	23	664
Jamul-Dulzura	21	21	14	12	3	3	74
Julian	0	0	0	0	0	0	0
Lakeside	28	27	19	16	4	3	97
Mountain Empire	0	0	0	0	0	0	0
North County Metro	113	111	75	67	17	14	397
North Mountain	0	0	0	0	0	0	0
Otay	0	125	250	500	625	700	2,200
Pala-Pauma	0	0	0	0	0	0	0
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	0	0	0	0	0	0	0
Ramona	3	3	2	2	0	0	10
San Dieguito	297	290	197	174	44	37	1,039
Spring Valley	52	51	35	31	8	6	183
Sweetwater	0	0	0	0	0	0	0
Valle De Oro	0	0	0	0	0	0	0
Valley Center	7	7	5	4	1	1	25
Total	**714**	**823**	**725**	**920**	**730**	**787**	**4,699**

Table 40. Cumulative Residential SPA Growth by CPA 2020-2050 High Estimate

Residential (High)	2020-2050 Cumulative by Year							2020-2050 Change		
SPA	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	130	130	130	130	130	130	130	0	0.0%	0.00%
Barona	0	0	0	0	0	0	0	0	NA	NA
Bonsall	500	500	500	500	500	500	500	0	0.0%	0.00%
Central Mountain	0	0	0	0	0	0	0	0	NA	NA
County Islands	0	0	0	0	0	0	0	0	NA	NA
Crest-Dehesa	357	357	357	357	357	357	357	0	0.0%	0.00%
Desert	333	758	1,191	1,510	1,833	1,987	2,142	1,809	543.6%	6.40%
Fallbrook	2,161	2,494	2,824	3,057	3,278	3,358	3,434	1,273	58.9%	1.56%
Jamul-Dulzura	19	541	1,072	1,462	1,856	2,042	2,228	2,209	11433.0%	17.15%
Julian	0	0	0	0	0	0	0	0	NA	NA
Lakeside	1,252	1,356	1,460	1,536	1,610	1,642	1,673	421	33.6%	0.97%
Mountain Empire	3	3	3	3	3	3	3	0	0.0%	0.00%
North County Metro	10,490	10,673	10,855	10,982	11,102	11,144	11,184	694	6.6%	0.21%
North Mountain	0	84	170	233	297	328	358	358	NA	NA
Otay	6	917	1,969	2,903	4,097	5,054	6,088	6,082	101367%	25.95%
Pala-Pauma	0	0	0	0	0	0	0	0	NA	NA
Pendleton-De Luz	0	0	0	0	0	0	0	0	NA	NA
Rainbow	0	0	0	0	0	0	0	0	NA	NA
Ramona	343	471	601	697	794	840	885	542	158.2%	3.21%
San Dieguito	7,729	8,082	8,429	8,668	8,884	8,948	9,005	1,276	16.5%	0.51%
Spring Valley	890	979	1,068	1,131	1,190	1,211	1,230	340	38.2%	1.08%
Sweetwater	0	0	0	0	0	0	0	0	NA	NA
Valle De Oro	5,005	5,005	5,005	5,005	5,005	5,005	5,005	0	0.0%	0.00%
Valley Center	301	408	517	597	677	715	754	453	150.3%	3.11%
Total	**29,520**	**32,759**	**36,152**	**38,772**	**41,614**	**43,265**	**44,977**	**15,457**	**52.4%**	**1.41%**

Table 41: Incremental Residential SPA Growth 2020-2050 in Five-Year Increments High Estimate

Residential (High) *(SPA)*	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	0	0	0	0	0	0	0
Barona	0	0	0	0	0	0	0
Bonsall	0	0	0	0	0	0	0
Central Mountain	0	0	0	0	0	0	0
County Islands	0	0	0	0	0	0	0
Crest-Dehesa	0	0	0	0	0	0	0
Desert	425	433	319	323	154	155	1,809
Fallbrook	333	330	233	221	80	76	1,273
Jamul-Dulzura	522	531	390	394	186	186	2,209
Julian	0	0	0	0	0	0	0
Lakeside	104	104	76	74	32	31	421
Mountain Empire	0	0	0	0	0	0	0
North County Metro	183	182	127	120	42	40	694
North Mountain	84	86	63	64	31	30	358
Otay	911	1,052	934	1,194	957	1,034	6,082
Pala-Pauma	0	0	0	0	0	0	0
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	0	0	0	0	0	0	0
Ramona	128	130	96	97	46	45	542
San Dieguito	353	347	239	216	64	57	1,276
Spring Valley	89	89	63	59	21	19	340
Sweetwater	0	0	0	0	0	0	0
Valle De Oro	0	0	0	0	0	0	0
Valley Center	107	109	80	80	38	39	453
Total	**3,239**	**3,393**	**2,620**	**2,842**	**1,651**	**1,712**	**15,457**

Employment Projections

Table 42. Cumulative Employment Growth by CPA 2020-2050 Base Estimate

Employment (Base)	2020-2050 Cumulative by Year							2020-2050 Change		
	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	5,571	5,664	5,754	5,816	5,871	5,885	5,897	326	5.8%	0.19%
Barona	3,046	3,046	3,046	3,046	3,046	3,046	3,046	0	0.0%	0.00%
Bonsall	2,922	2,987	3,050	3,093	3,131	3,141	3,149	227	7.8%	0.25%
Central Mountain	406	411	417	420	423	424	424	18	4.4%	0.14%
County Islands	157	163	170	174	178	179	179	23	14.6%	0.45%
Crest-Dehesa	3,046	3,092	3,136	3,166	3,192	3,199	3,205	158	5.2%	0.17%
Desert	1,132	1,143	1,155	1,162	1,169	1,171	1,172	40	3.5%	0.12%
Fallbrook	8,291	8,523	8,750	8,905	9,042	9,076	9,105	814	9.8%	0.31%
Jamul-Dulzura	2,223	2,271	2,319	2,351	2,379	2,386	2,392	169	7.6%	0.25%
Julian	801	814	827	836	844	846	848	47	5.9%	0.19%
Lakeside	14,815	15,037	15,253	15,401	15,531	15,564	15,591	776	5.2%	0.17%
Mountain Empire	1,189	1,203	1,216	1,225	1,233	1,235	1,236	47	4.0%	0.13%
North County Metro	9,871	10,049	10,223	10,342	10,447	10,473	10,496	625	6.3%	0.20%
North Mountain	551	558	564	569	573	574	575	24	4.3%	0.14%
Otay	4,071	6,541	9,010	11,480	13,950	16,419	18,889	14,818	364.0%	5.25%
Pala-Pauma	5,728	5,793	5,855	5,898	5,935	5,946	5,954	227	4.0%	0.13%
Pendleton-De Luz	2,282	2,282	2,282	2,282	2,282	2,282	2,282	0	0.0%	0.00%
Rainbow	1,147	1,154	1,162	1,167	1,171	1,173	1,174	28	2.4%	0.08%
Ramona	6,039	6,142	6,242	6,311	6,371	6,386	6,398	360	6.0%	0.19%
San Dieguito	14,718	15,160	15,591	15,882	16,141	16,206	16,260	1,542	10.5%	0.33%
Spring Valley	7,994	8,098	8,199	8,269	8,330	8,345	8,358	363	4.5%	0.15%
Sweetwater	1,890	1,907	1,924	1,936	1,946	1,949	1,951	61	3.2%	0.11%
Valle De Oro	8,255	8,302	8,348	8,379	8,407	8,414	8,420	166	2.0%	0.07%
Valley Center	4,493	4,581	4,666	4,725	4,777	4,789	4,800	307	6.8%	0.22%
Total	**110,636**	**114,921**	**119,160**	**122,833**	**126,368**	**129,106**	**131,801**	**21,165**	**19.1%**	**0.59%**

Table 43: Incremental Employment Growth 2020-2050 in Five-Year Increments Base Estimate

Employment (Base)	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	93	90	62	55	14	12	326
Barona	0	0	0	0	0	0	0
Bonsall	64	64	43	38	9	9	227
Central Mountain	5	5	3	3	1	1	18
County Islands	7	6	4	4	1	1	23
Crest-Dehesa	46	44	30	27	7	6	158
Desert	12	11	8	7	2	1	40
Fallbrook	233	227	155	137	34	29	814
Jamul-Dulzura	48	48	32	28	7	6	169
Julian	13	13	9	8	2	2	47
Lakeside	222	216	148	130	33	27	776
Mountain Empire	14	13	9	8	2	2	47
North County Metro	178	174	119	105	26	23	625
North Mountain	7	7	5	4	1	1	24
Otay	2,470	2,470	2,470	2,470	2,470	2,470	14,818
Pala-Pauma	65	62	43	37	11	9	227
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	8	8	5	5	2	2	28
Ramona	103	101	68	60	15	12	360
San Dieguito	441	431	291	259	65	54	1,542
Spring Valley	104	101	69	61	15	13	363
Sweetwater	17	17	12	10	2	2	61
Valle De Oro	48	46	31	28	7	6	166
Valley Center	88	85	59	52	13	11	307
Total	4,285	4,239	3,673	3,535	2,738	2,695	21,165

Table 44. Cumulative Employment Growth by CPA 2020-2050 High Estimate

Employment (High)	2020-2050 Cumulative by Year							2020-2050 Change		
	2020	2025	2030	2035	2040	2045	2050	#	%	CAGR
Alpine	5,571	5,664	5,754	5,816	5,871	5,885	5,897	326	5.8%	0.19%
Barona	3,046	3,046	3,046	3,046	3,046	3,046	3,046	0	0.0%	0.00%
Bonsall	2,922	2,987	3,050	3,093	3,131	3,141	3,149	227	7.8%	0.25%
Central Mountain	406	411	417	420	423	424	424	18	4.4%	0.14%
County Islands	157	163	170	174	178	179	179	23	14.6%	0.45%
Crest-Dehesa	3,046	3,092	3,136	3,166	3,192	3,199	3,205	158	5.2%	0.17%
Desert	1,132	1,278	1,427	1,536	1,645	1,696	1,747	615	54.4%	1.46%
Fallbrook	8,291	8,594	8,893	9,101	9,291	9,351	9,406	1,116	13.5%	0.42%
Jamul-Dulzura	2,223	2,608	2,998	3,283	3,568	3,698	3,827	1,604	72.2%	1.83%
Julian	801	814	827	836	844	846	848	47	5.9%	0.19%
Lakeside	14,815	15,077	15,333	15,511	15,672	15,719	15,761	946	6.4%	0.21%
Mountain Empire	1,189	1,203	1,216	1,225	1,233	1,235	1,236	47	4.0%	0.13%
North County Metro	9,871	10,092	10,309	10,460	10,597	10,639	10,677	806	8.2%	0.26%
North Mountain	551	585	620	645	670	681	692	141	25.6%	0.76%
Otay	4,071	6,770	9,468	12,167	14,865	17,564	20,262	16,191	397.7%	5.50%
Pala-Pauma	5,728	5,793	5,855	5,898	5,935	5,946	5,954	227	4.0%	0.13%
Pendleton-De Luz	2,282	2,282	2,282	2,282	2,282	2,282	2,282	0	0.0%	0.00%
Rainbow	1,147	1,154	1,162	1,167	1,171	1,173	1,174	28	2.4%	0.08%
Ramona	6,039	6,200	6,360	6,473	6,578	6,614	6,647	609	10.1%	0.32%
San Dieguito	14,718	15,223	15,718	16,057	16,363	16,451	16,528	1,810	12.3%	0.39%
Spring Valley	7,994	8,112	8,228	8,308	8,380	8,400	8,418	424	5.3%	0.17%
Sweetwater	1,890	1,907	1,924	1,936	1,946	1,949	1,951	61	3.2%	0.11%
Valle De Oro	8,255	8,302	8,348	8,379	8,407	8,414	8,420	166	2.0%	0.07%
Valley Center	4,493	4,645	4,795	4,901	5,001	5,038	5,073	580	12.9%	0.41%
Total	**110,636**	**116,002**	**121,337**	**125,878**	**130,290**	**133,568**	**136,803**	**26,167**	**23.7%**	**0.71%**

Table 45: Incremental Employment Growth 2020-2050 in Five-Year Increments High Estimate

Employment (High)	2020-25	2025-30	2030-35	2035-40	2040-45	2045-50	2020-50
Alpine	93	90	62	55	14	12	326
Barona	0	0	0	0	0	0	0
Bonsall	64	64	43	38	9	9	227
Central Mountain	5	5	3	3	1	1	18
County Islands	7	6	4	4	1	1	23
Crest-Dehesa	46	44	30	27	7	6	158
Desert	146	149	109	109	51	51	615
Fallbrook	304	299	208	191	60	55	1,116
Jamul-Dulzura	385	390	285	285	130	129	1,604
Julian	13	13	9	8	2	2	47
Lakeside	262	256	178	161	47	42	946
Mountain Empire	14	13	9	8	2	2	47
North County Metro	221	218	150	137	42	38	806
North Mountain	34	35	25	25	11	11	141
Otay	2,699	2,699	2,699	2,699	2,699	2,699	16,191
Pala-Pauma	65	62	43	37	11	9	227
Pendleton-De Luz	0	0	0	0	0	0	0
Rainbow	8	8	5	5	2	2	28
Ramona	162	160	112	105	37	33	609
San Dieguito	505	496	339	306	88	77	1,810
Spring Valley	118	116	80	72	20	18	424
Sweetwater	17	17	12	10	2	2	61
Valle De Oro	48	46	31	28	7	6	166
Valley Center	152	150	106	100	36	35	580
Total	**5,366**	**5,335**	**4,541**	**4,411**	**3,278**	**3,236**	**26,167**

Application of Marketable Site Capacity Constraints

Table 46: Summary of Where Forecast Demand Exceeded Draft Projections

Community Plan Area and Housing Type	Unit Demand Exceeding Marketable Site Supply	CPA Where Excess Demand Redirected
Alpine		
SPA	5	Lakeside
Barona		
Single-Family Large Lot (<VR 2)	6	Lakeside
Bonsall		
SPA	17	Fallbrook
Crest-Dehesa		
Single-Family Small Lot (VR 2 to VR 7.3)	2	Alpine
Multifamily Higher Density (>VR 15 to VR 30)	2	Spring Valley
SPA	12	Lakeside
Desert		
Multifamily Lower Density (>VR 7.3 to VR 15)	3	Alpine
Multifamily Higher Density (>VR 15 to VR 30)	2	Fallbrook
Jamul-Dulzura		
Single-Family Small Lot (VR 2 to VR 7.3)	1	Alpine
Multifamily Lower Density (>VR 7.3 to VR 15)	1	Alpine
Julian		
Single-Family Small Lot (VR 2 to VR 7.3)	5	Ramona
Multifamily Higher Density (>VR 15 to VR 30)	1	Ramona
Mountain Empire		
Single-Family Small Lot (VR 2 to VR 7.3)	12	Desert
Multifamily Lower Density (>VR 7.3 to VR 15)	1	Ramona
North Mountain		
Multifamily Lower Density (>VR 7.3 to VR 15)	2	Valley Center
Multifamily Higher Density (>VR 15 to VR 30)	1	Valley Center
Pendleton-De Luz		
Single-Family Large Lot (<VR 2)	212	25% Bonsall, 75% Fallbrook
Rainbow		
Single-Family Small Lot (VR 2 to VR 7.3)	4	Fallbrook
San Dieguito		
Single-Family Small Lot (VR 2 to VR 7.3)	6	North County Metro
Multifamily Lower Density (>VR 7.3 to VR 15)	54	North County Metro
Sweetwater		
Multifamily Higher Density (>VR 15 to VR 30)	16	County Islands
Valle De Oro		
Multifamily Lower Density (>VR 7.3 to VR 15)	8	County Islands
Multifamily Higher Density (>VR 15 to VR 30)	42	County Islands
SPA	143	50% Spring Valley, 50% Jamul
TOTAL	**558**	

Table 47: SPA Summary

CPA	SPA	Total Inventory	Units Built 2011-2021	Pipeline	Unbuilt Capacity	Development Status	Summary Description
Alpine	Alpine Highlands	121	0	0	0	Built Out	Small Lot Development. Built out.
Bonsall	Champagne Gardens	0	0	0	0	Dormant	Mixed-use residential and commercial development approved in 1999. No development has yet occurred.
Bonsall	Lake Rancho	0	0	0	0	Built Out	Open space area spills over into Bonsall, but all units built are in Fallbrook.
Bonsall	Vista Valley	169	0	0	0	Built Out	Several large lot SFR and more small lot SFR at 4,000-5,000 square foot lots built around a Country Club. Built out.
Crest-Dehesa	Singing Hills	362	0	0	0	Built Out	Mix of Large and Small Lot SFR built around a golf course and open space. Built out.
Crest-Dehesa	Conrock					Built Out	Non-residential development.
Desert	Borrego	102	0	0	732	Dormant	Mostly Undeveloped GPA. 100 MFR units built on a single lot, which has become a hotel. Three other large lots remain vacant. No development since 1998.
Desert	Mesquite Trails	0	0	0	0	Dormant	Proposed residential development for SFR and mobile lots with community facilities. Proposed in 1976, EIR in 1993 found significant impacts. No development has yet occurred.
Desert	Rams Hill	268	1	1	1,079	Active	Residential, hotel, country club, golf course, entitled for 1,300 units, proposed in 1980, has 268 built units, with 1 unit built in the past 10 years.
Fallbrook	CampusPark	658	580	104	93	Active	Mostly built out, with 93 more units of capacity, likely small lot and detached condos. Eventually to add commercial and educational uses.
Fallbrook	Campus Park West	0	0	0	283	In Development	Recently approved expansion of Campus Park to include 283 SFR and detached condos.
Fallbrook	Lake Rancho	757	0	0	17	Built Out	SFR and mobile homes with community facilities. Ongoing turnover with new mobile homes, seen in building permit data, but minimal net new units.
Fallbrook	Meadowood	0	0	0	844	In Development	Ground broken for future 844 homes in 2021, likely to be fully built out based on location and historical growth trajectory.
Fallbrook	Pala Mesa	431	51	22	36	Active	Nearly fully built out GPA with active pipeline and recent home construction.
Fallbrook	Peppertree Park	218	0	0	0	Built Out	SFR Neighborhood with open space and community center or school. Built out.
Fallbrook	Sycamore Ranch	243	1	2	0	Built Out	SFR Neighborhood built around a Golf Course/Country Club. Built out, but 3 ADUs built recently.
Jamul-Dulzura	Otay Ranch	0	0	0	2,209	In Development	Major residential development with limited commercial uses. 2,209 Future units in Otay Ranch, extension of Chula Vista and Otay CPA Otay Ranch Concept.
Lakeside	East County Square	191	0	0	4	Built Out	SFR and commercial uses, including a big-box anchored retail center. Built out.
Lakeside	Greenhills Ranch	33	31	0	79	Active	SFR at 2.5 DU/AC and open space, phase 1 is built out and phase 2 will be subject to further amendments. Remaining capacity of 79 in phase 2.
Lakeside	High Meadows	23	16	3	224	Active	SFR development on lots ranging from 1/2 acre to 5 acres. Only a small portion of the 248 total have been built. Active development.
Lakeside	Lake Jennings	409	2	2	0	Built Out	SFR and Mobile Development. Built out.
Lakeside	Los Coches	232	3	1	0	Built Out	SFR Development. Built out.
Lakeside	Quail Canyon	171	2	0	0	Built Out	SFR Development. Built out.
Lakeside	USDRIP	234	1	0	114	Active	County Initiated Multi-use SPA
Mountain Empire	Jacumba Valley	3	0	0	1,244	Dormant	Solar power project, no units can be developed until after 2050.
North County Metro	Hidden Meadows	827	9	2	255	Active	SFR development including a country club and golf course, upzoned in 1988 to allow for 1083 units, 255 remaining unbuilt capacity. Active development.
North County Metro	Mountain Gate	3	0	0	153	Dormant	Large Lot SFR on active agricultural land planned, 153 units yield, entitled since 2001. Project has been dormant.
North County Metro	Sugarbush	45	45	0	0	Built Out	Small 45-unit SFR development. Built out.
North County Metro	Welk Resort	1,016	75	1	286	Active	Resort, mobile homes, condos, SFR SPA, wild, still some SFR capacity. Active development.
North Mountain	Warner Springs	0	0	0	358	Dormant	Entitled for SFR, no development has occurred, entitled since 1983, 358 units of capacity. Dormant.
Otay	East Otay	16	0	0	3,218	In Development	Large mixed-use, mostly industrial, includes village with 3,128 units entitled.
Otay	Otay Ranch	0	0	0	2,924	In Development	Two villages, 13 and 14, entitled for 2,924. There is also office space, commercial space, parks and recreational facilities in a large planned development.
Ramona	Holly Oaks	90	0	0	0	Built Out	SFR built out.
Ramona	Montecito Ranch	1	0	0	417	In Development	Future development site for SFR, school, institution, lots of open space, approved 2010, 417 future units. Greenfield undeveloped.
Ramona	Mt Woodson Ranch	196	0	0	0	Built Out	SFR development. Built out.
Ramona	Rancho San Vicente	241	0	0	0	Built Out	SFR development. Built out.
Ramona	Cummings Ranch	0	0	0	125	In Development	Recently approved 125 large lot SFR.
San Dieguito	4S Ranch	5,463	0	0	55	Active	Huge, multiple phases, stages and sizes, nearly built out, 55 units remaining. Active development.
San Dieguito	Cielo del Norte	2	0	0	122	Active	Entitled but mostly unbuilt, 2 units built with 122 remaining. Active development.
San Dieguito	El Apajo	48	3	0	0	Built Out	SFR 47 units built. Built out.

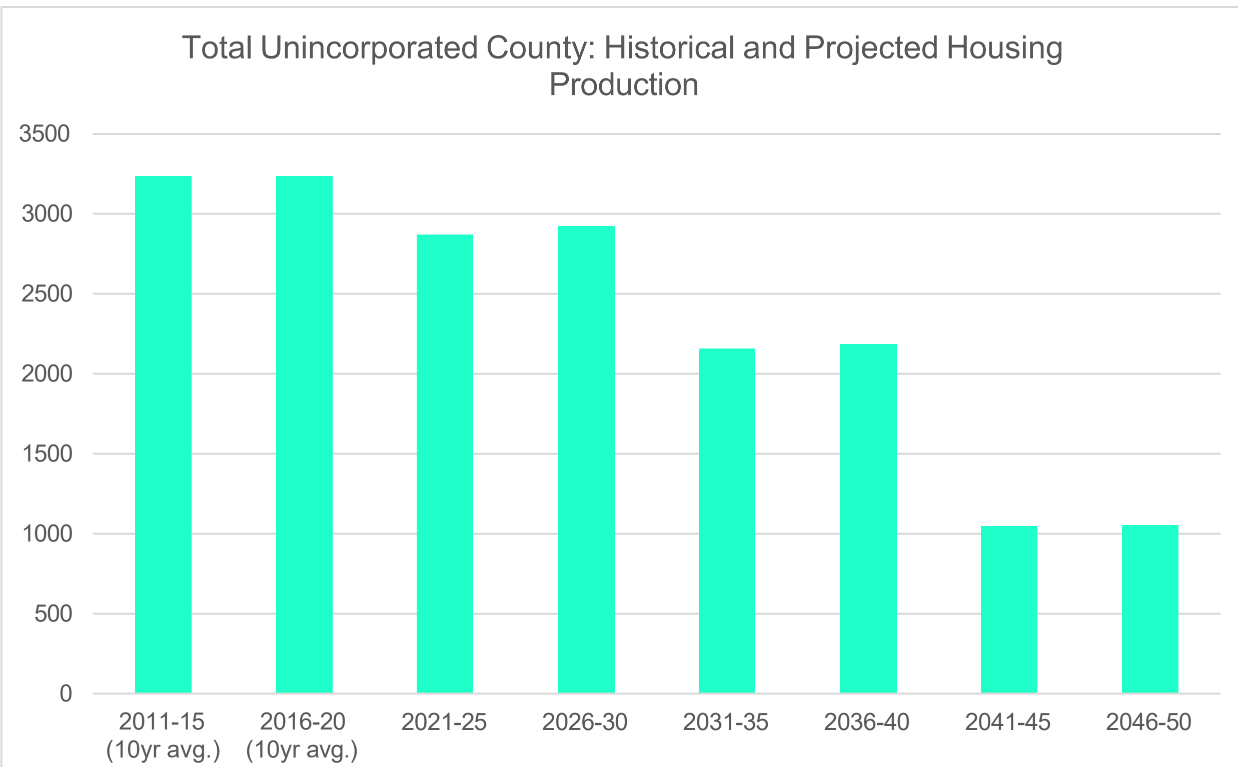
San Dieguito	Fairbanks Ranch	649	14	5	0	Built Out	One of the original SFR GPA projects. Very high-end, large lot homes. Built out.
San Dieguito	HarmonyGrove	699	597	92	39	Active	Building and almost built out, pending the Harmony Grove South approval, 39 units at current capacity. Still Active development.
San Dieguito	HarmonyGrove Village S.	0	0	0	453	In Development	Recently approved project to add 453 units of SFR (small and large) and MFR (low density) along with community facilities.
San Dieguito	Rancho Cielo	235	109	10	93	Active	SFR mostly built out, perhaps another phase or preserved land, 93 units left.
San Dieguito	Rancho Santa Fe	102	0	0	0	Built Out	SFR development. Built out.
San Dieguito	Santa Fe Creek	39	6	0	5	Active	SFR. Nearly built out with 5 more units of remaining capacity. Active development.
San Dieguito	Santa Fe Valley	991	243	120	123	Active	Large multi-phase GPA project is mostly built. 123 remaining units across different subareas. Active development.
San Dieguito	Valiano	0	0	0	326	In Development	Recently approved project to add 326 SFR at varying densities.
Spring Valley	Pointe Spring	853	88	0	0	Active	County GPA.
Spring Valley	Sweetwater Place	0	0	0	122	In Development	Recently approved 122 small lot SFR on infill vacant space.
Spring Valley	Sweetwater Vista	0	0	0	218	In Development	Recently approved 218 small lot SFR or detached condos on infill commercial space.
Valle De Oro	Rancho San Diego	4,956	2	0	0	Built Out	Large, legacy GPAs, mostly SFR but also quite a lot of MFR and commercial, mixed-use development with multiple lot sizes and building types. Built out.
Valley Center	Champagne Gardens	1	0	0	0	Dormant	Complications with Entitlements and EIR, but no units and stalled development. Dormant.
Valley Center	Live Oak Ranch	1	0	0	148	Dormant	Entitled for 148 units, unclear status with EIR. Dormant.
Valley Center	Orchard Run	0	0	0	300	Active	SFR development, stalled for many years, construction has begun, 300 units to be completed.
Valley Center	Woods Valley Ranch	287	16	0	5	Active	SFR almost completely built out, 5 units remaining.
Total		**21,386**	**1,895**	**365**	**16,703**		

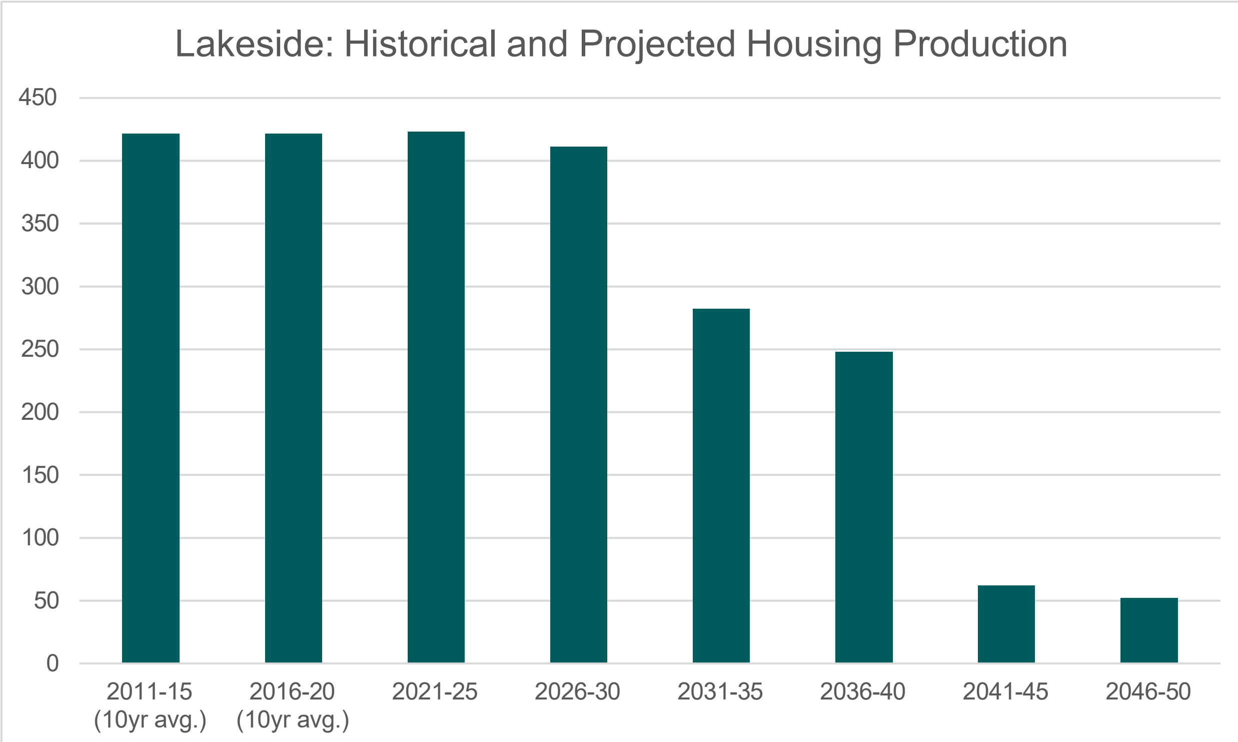
Incremental Housing Growth 2000-2050 for the Top 10 CPAs

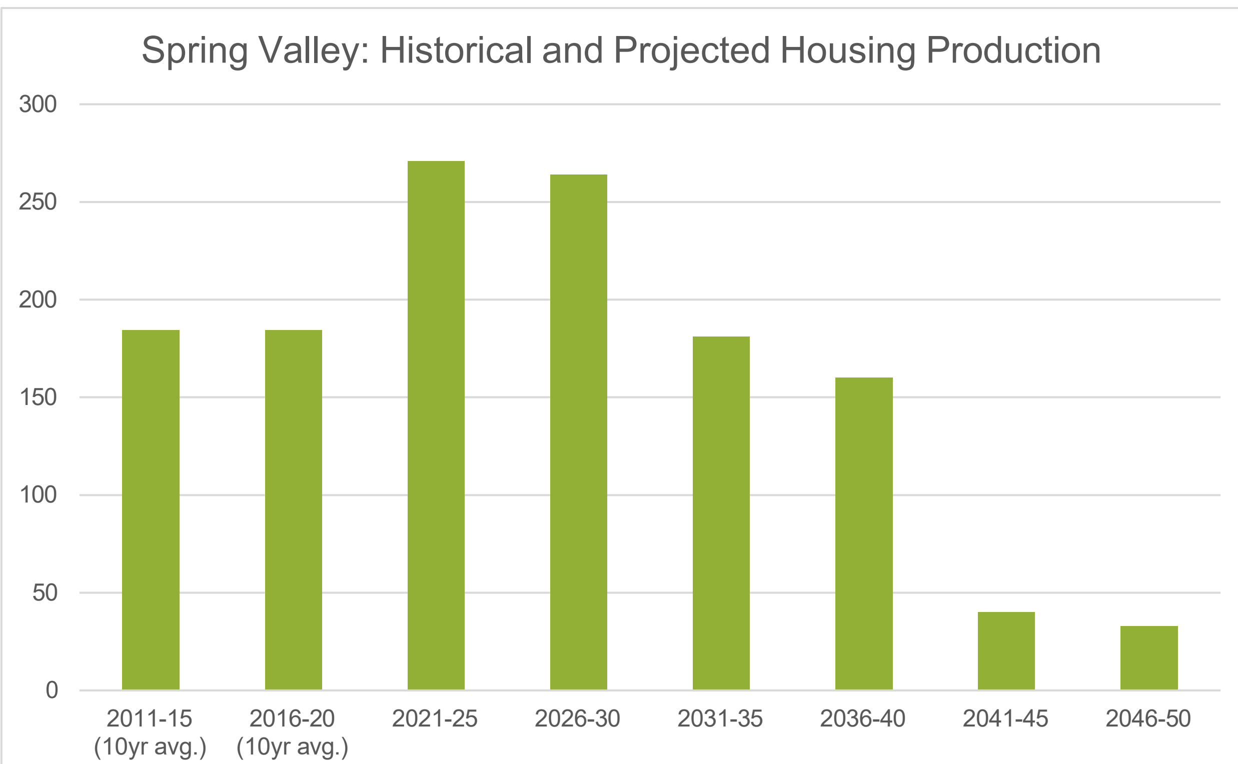
The following charts show recent historical (2000-2020) and projected Baseline (2020-2050) housing unit growth in 5-year increments for the total unincorporated county area as well as the top-10 CPAs by total housing inventory (excluding number eight Pendleton De-Luz, which has no forecast growth).

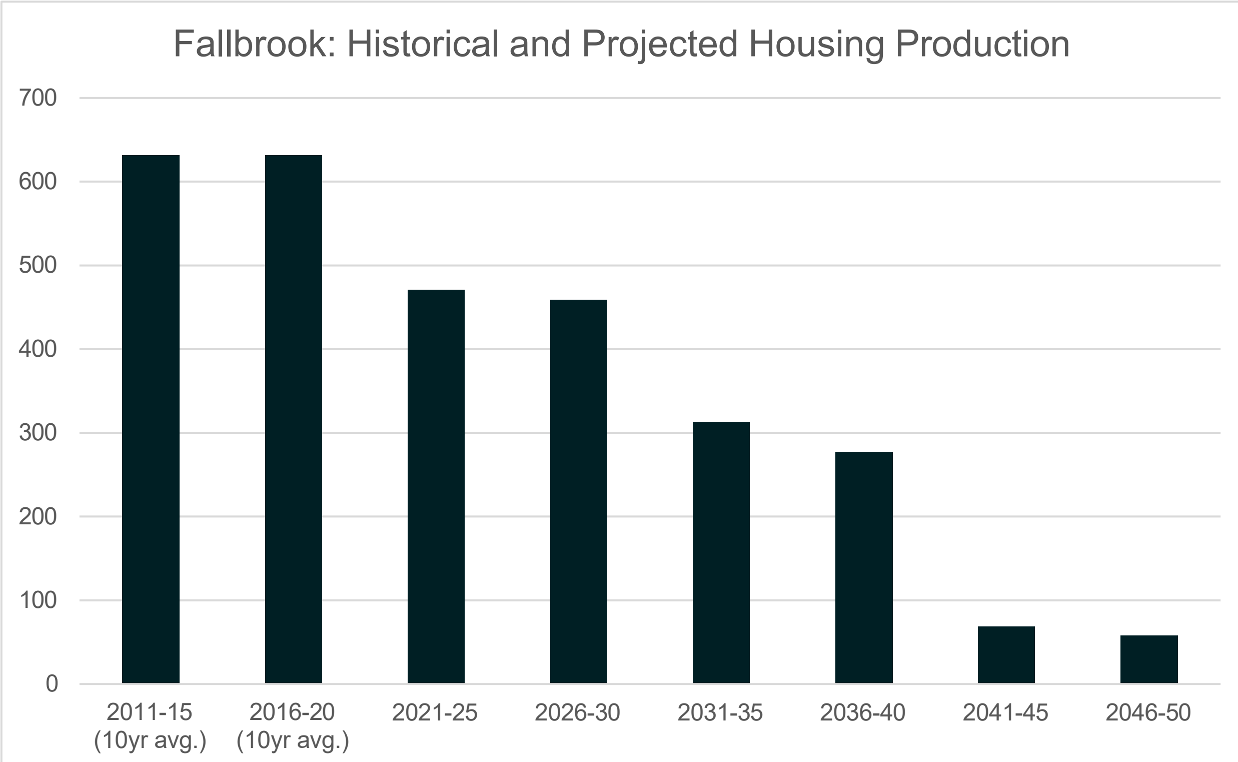
The top-10 CPAs by 2020 housing inventory are:

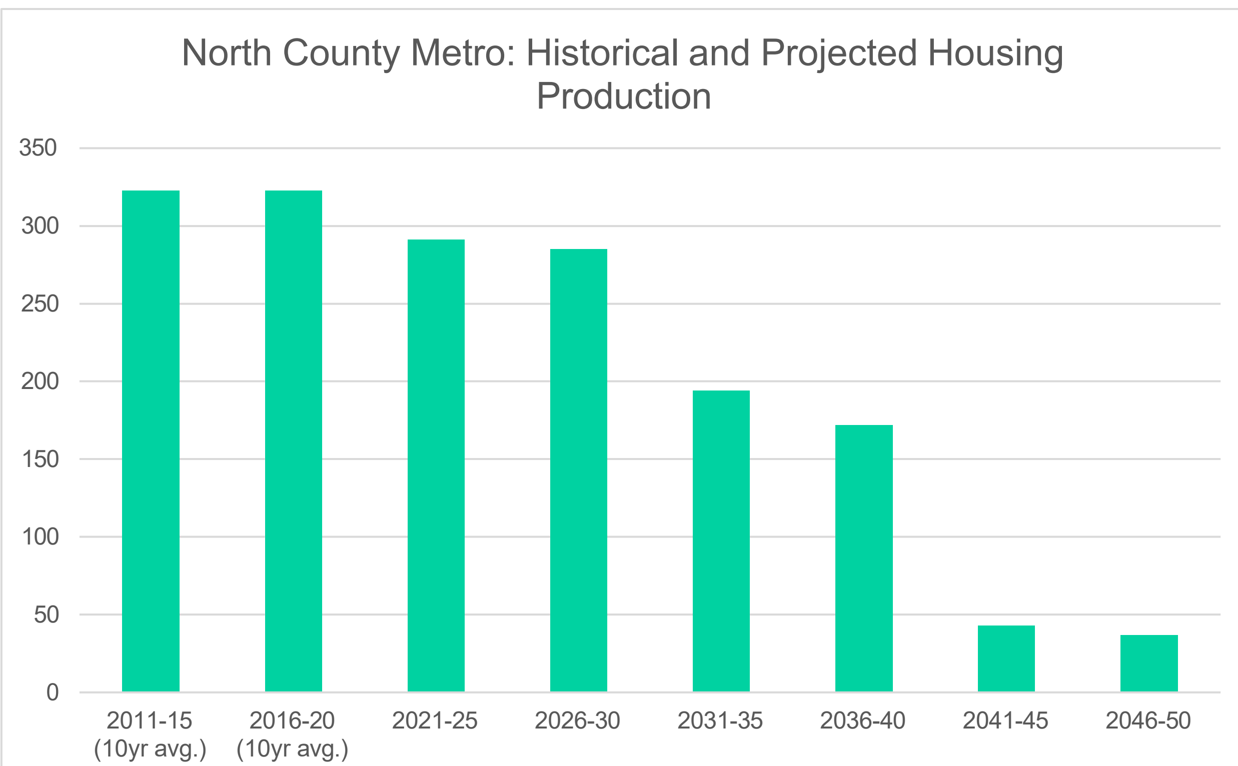
1. Lakeside
2. Spring Valley
3. Fallbrook
4. North County Metro
5. Valle de Oro
6. San Dieguito
7. Ramona
8. Pendleton De-Luz (not shown below, as there is no projected growth in this CPA)
9. Valley Center
10. Alpine

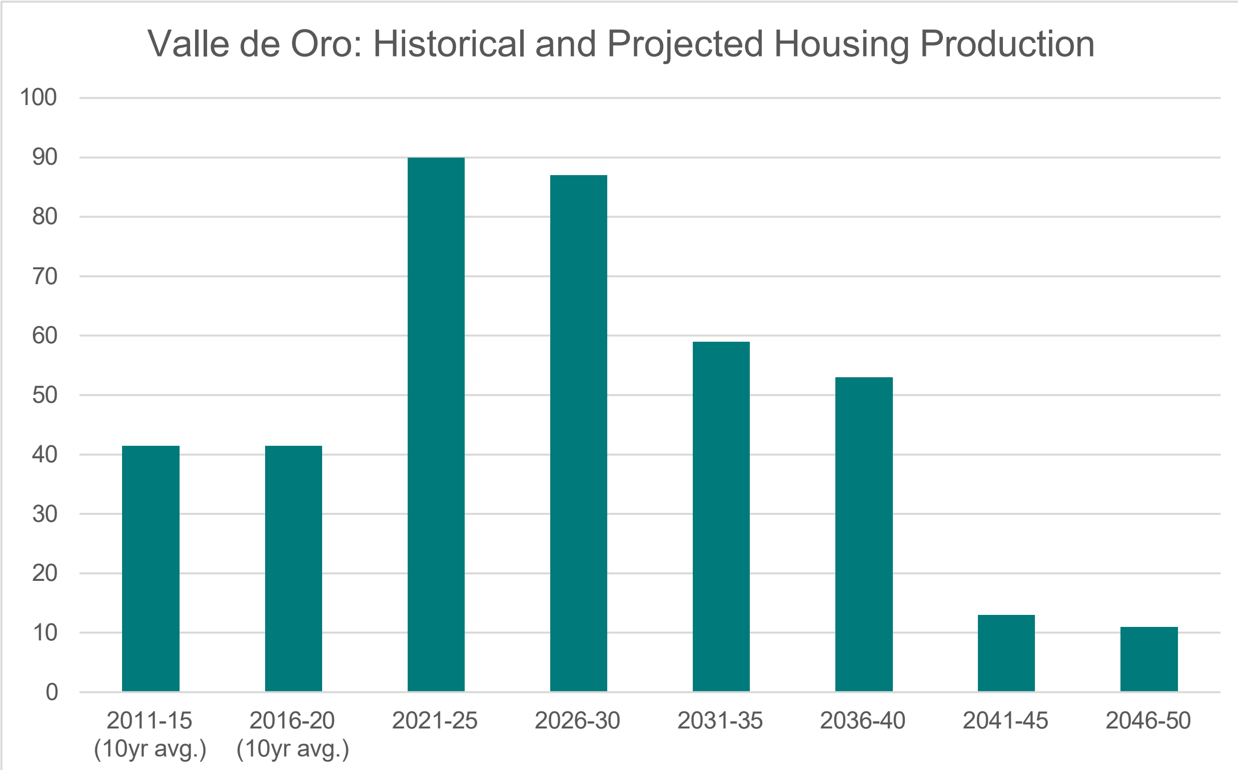


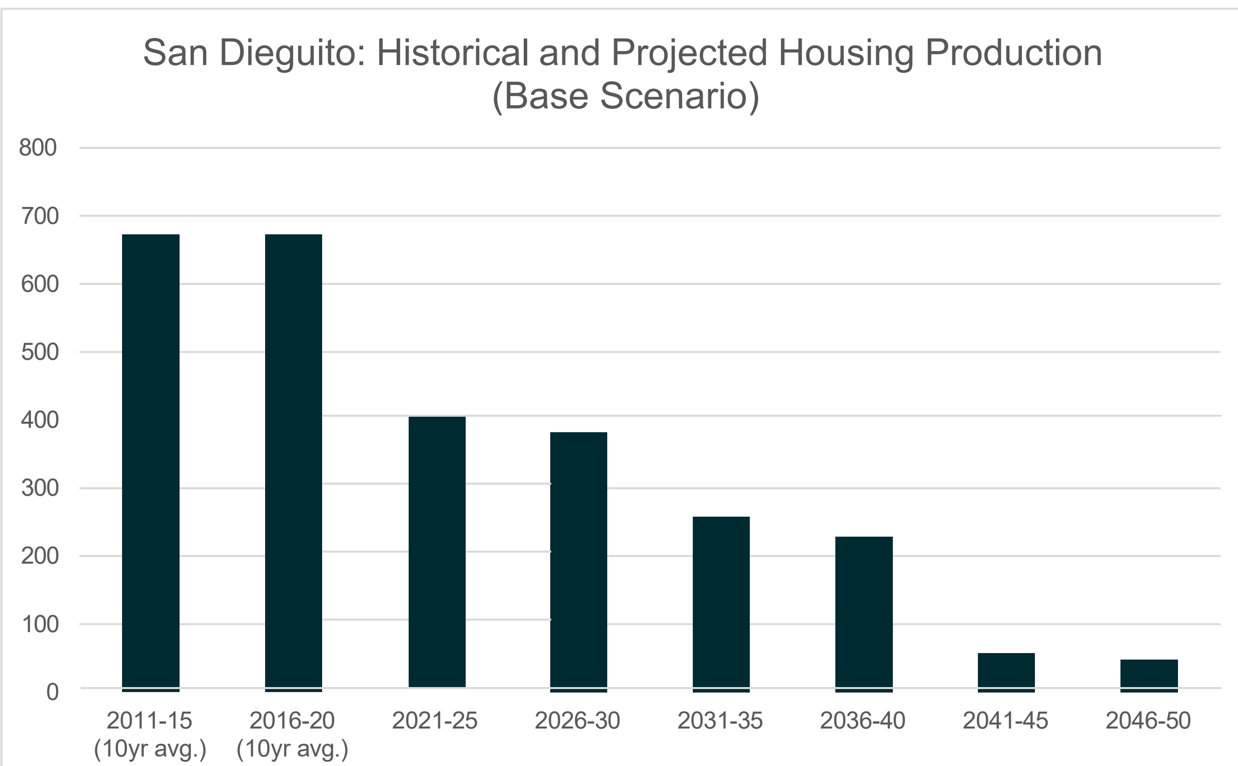

Lakeside: Historical and Projected Housing Production
450
400
350
300
250
200
150
100
50
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50

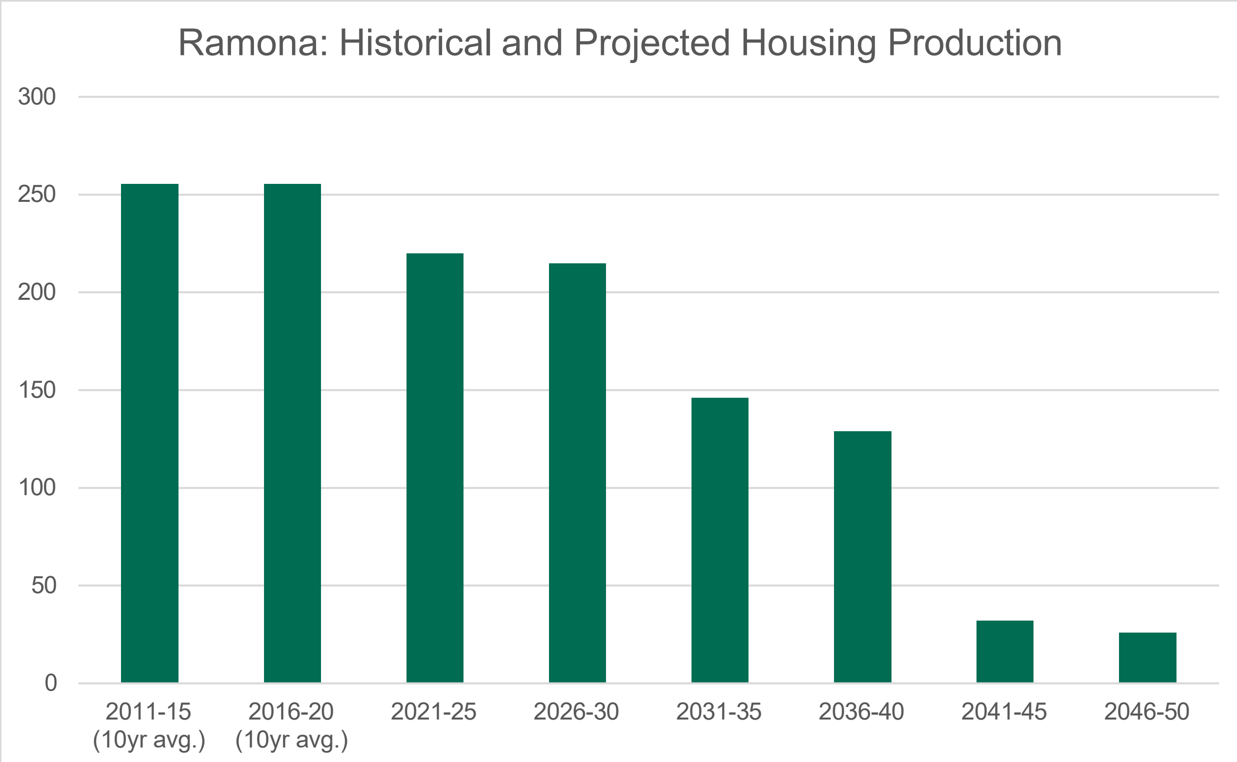

Spring Valley: Historical and Projected Housing Production
300
250
200
150
100
50
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50

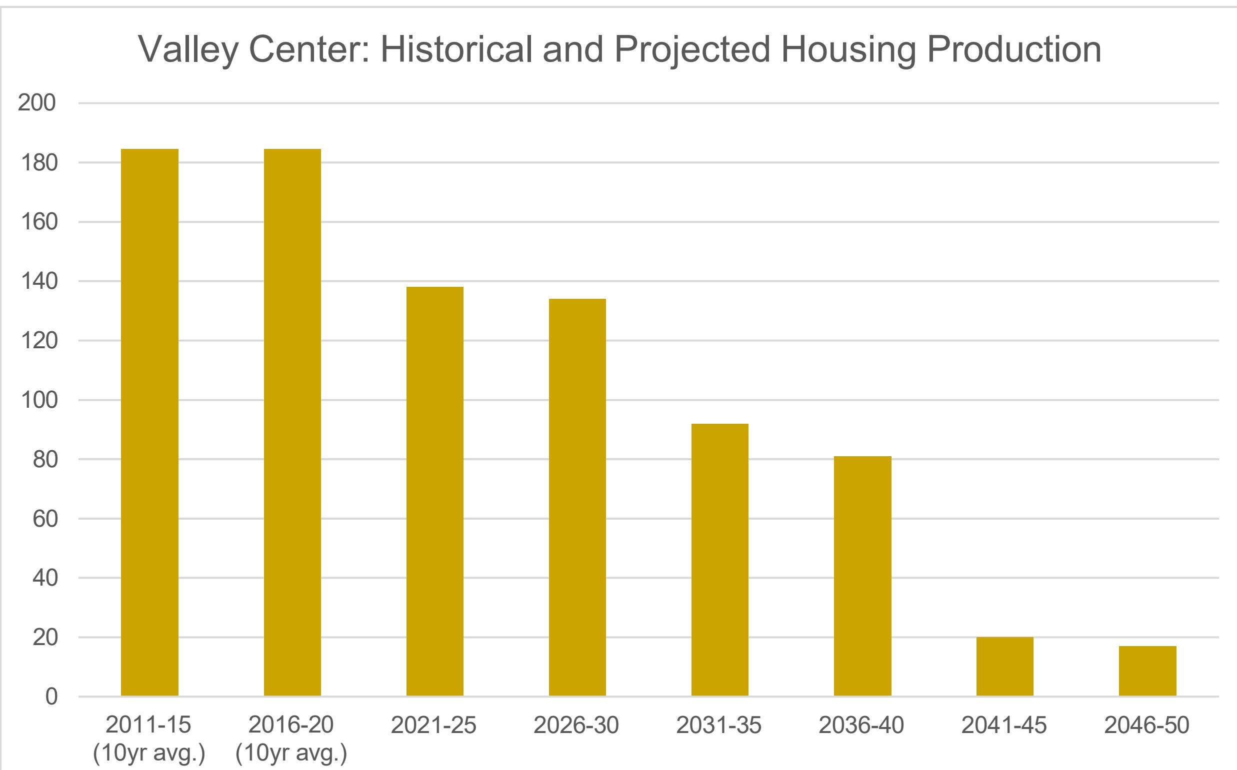

Fallbrook: Historical and Projected Housing Production
700
600
500
400
300
200
100
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50

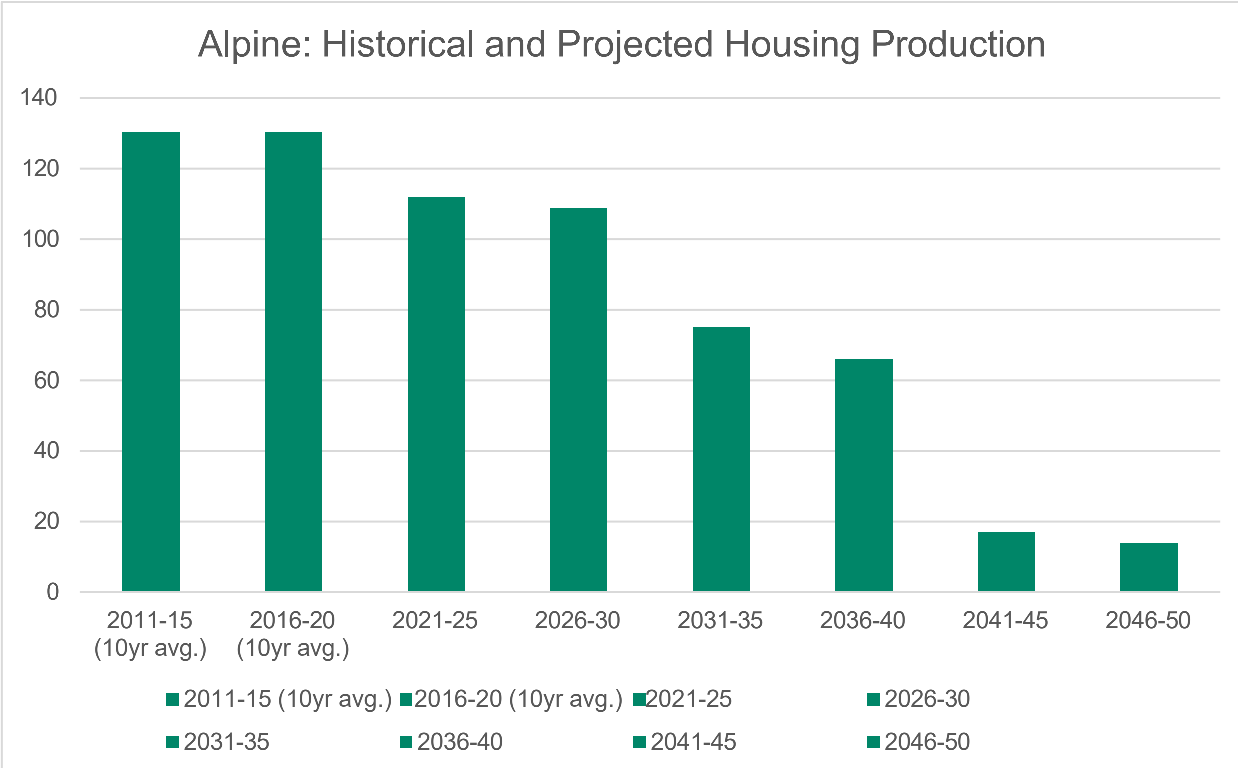

North County Metro: Historical and Projected Housing Production
350
300
250
200
150
100
50
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50


Valle de Oro: Historical and Projected Housing Production
100
90
80
70
60
50
40
30
20
10
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50


San Dieguito: Historical and Projected Housing Production (Base Scenario)
800
700
600
500
400
300
200
100
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50


Ramona: Historical and Projected Housing Production
300
250
200
150
100
50
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50


Valley Center: Historical and Projected Housing Production
200
180
160
140
120
100
80
60
40
20
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50


Alpine: Historical and Projected Housing Production
140
120
100
80
60
40
20
0
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50
2011-15 (10yr avg.)
2016-20 (10yr avg.)
2021-25
2026-30
2031-35
2036-40
2041-45
2046-50

Glossary of Acronyms

CAGR: Compound Annual Growth Rate

CAP: Climate Action Plan:

CCR: Covenants, Conditions, Restrictions

CEQA: California Environmental Quality Act

CPA: Community Plan Area

DUAC: Dwelling Units per Acre

EIR: Environmental Impact Report

GPA: General Plan Amendment

SPA: Specific Plan Area

VMT: Vehicle Miles Traveled

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Appendix B

Attachment B2

Peer Review of the Population, Employment, and Housing Projections 2020-2050

COUNTY CONTRACT NUMBER 566060

Prepared for

For the County of San Diego
Planning and Development Services

Prepared by

The California Economic Forecast
5385 Hollister Avenue, Suite 207
Santa Barbara, CA 93111
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FINAL REPORT

October 2023

The California Economic Forecast
5385 Hollister Avenue, Suite 207
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To: Meghan Kelly
County of San Diego
Planning and Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92123-1204

From: Mark Schniepp

RE: Peer Review, Contract Number *566060*

I have attached the final report on the peer review of the AECOM report.

Our review of the study involved a thorough analysis of the data, the assumptions, the methodology and the final projections. We addressed a number of issues associated with the study while still in draft status. These issues were all subsequently resolved.

We can now confirm that the report's methodology is reasonable, is an extension of the historical data, and that the projections can be explained by demographic forces in place, or by the constraints imposed by market capacity within the Community Planning Areas of San Diego County.

Sincerely,

Mark Schniepp

Mark Schniepp
Principal

Executive Summary

This document details our peer review of the AECOM report for the unincorporated area of San Diego County, hereafter referred to in this document as the "Report."

Our review evaluated the Report's assumptions regarding housing supply and demand, and the methodology for determining projections for housing growth in the unincorporated area, disaggregated by community planning area, through 2050.

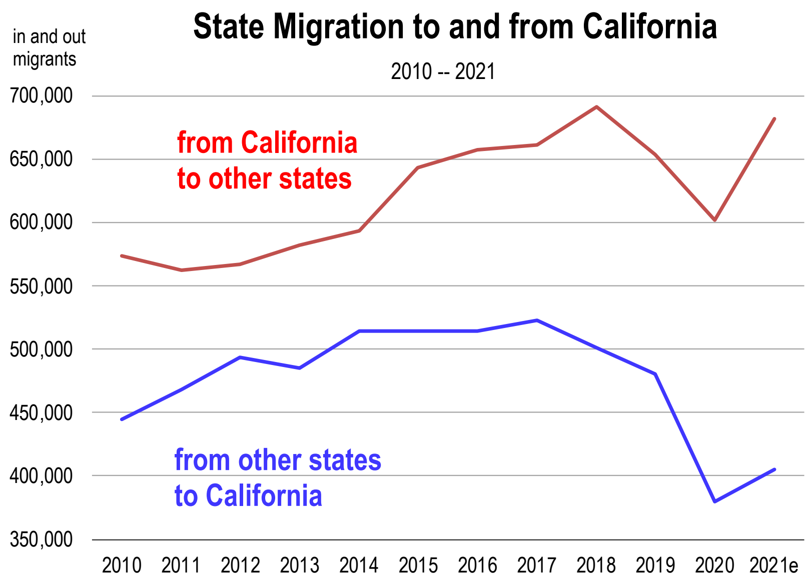


Figure 1: State In and Out Migration

The consensus of current forecasts for population, housing, and job creation call for slower growth in California's coastal counties, including San Diego County.

Slower growth is not limited to the unincorporated area but also to the metro areas which principally dominate the coastal zone of the County. These trends have been in place for many years but they have accelerated over the last four years as the annual inflow of migrants to California has plunged.

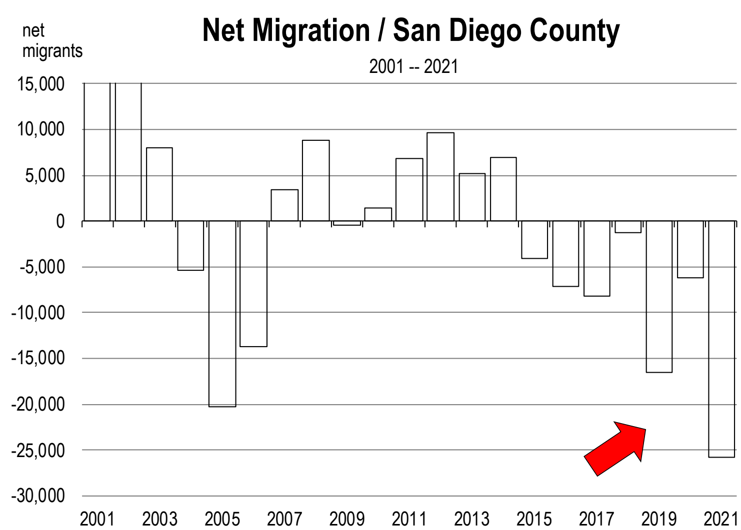


Figure 2: Net Migration San Diego County

The outflow of population from San Diego County mirrors the statewide numbers. The Department of Finance estimates of net migration (which is equal to gross incoming populations less gross outgoing populations) has been negative for the County for the last seven consecutive years, escalating to record negative levels in 2021.

That said, an implied conclusion of the Report is that the growth of population and housing will decline over the forecast period, consistent with recent history and the forecasts for coastal California.[1] Though housing demand currently is strong in California and new housing permits have increased, the longer term forecast does not indicate a departure from the most recent evidence indicative of San Diego County.

We are in concurrence with the Report that growth projections of population, employment and housing will be markedly lower over the longer term forecast, and less housing will be required than was built historically.

Factors that impact the housing forecast

Household Size

Household size (or the population-to-units ratio) is moving lower. The ratio has been moving lower for years and the forecast based on demographic trends is for household size to continue moving lower. The Report uses household size to project population in the unincorporated area. Whereas there is a clear observed decline in the ratio between 2000 and 2021 for the unincorporated area of the county, the projections to 2050 incorporate this trajectory in the Housing Study, for all community planning areas.

A reduced forecast of housing through 2050 is likely despite fewer occupants per house which by itself would increase the need for more housing units. Consequently, key determining factors of housing demand are the extent of forecasted population growth, and the extent to which household sizes diminish over time. This is a pure mathematical exercise that the Report authors have considered in the derivation of their housing unit projections.[2]

Accessory Dwelling Units (ADUs): California Assembly Bill 345 and State Bill 9

These new laws enable the building of accessory units and duplexes on single family zoned parcels, with only a ministerial approval process. They were legislated for the sole purpose of increasing housing supply in California. We suggested that a narrative should be added

[1] See Bank of the West forecast "California Economic Outlook Report-December 2021," January 2022, https://www.bankofthewest.com/alpha/wealth-management/insights/economic-report/california-economic-outlook-report-december-2021.html or Southern California Association of Governments "Demographics and Growth Forecast," Technical Report, September 2020, https://scag.ca.gov/sites/main/files/file-attachments/0903fconnectsocal_demographics-and-growth-forecast.pdf?1606001579

[2] See page 17 of the Housing Study.

to address why (or why not) these two laws are not relevant factors in the forecast of housing supply in San Diego County over the next 30 years.[3]

We suggested that a more expanded narrative---perhaps as an appendix---for the housing forecasts for the CPAs be added to the main housing report. When we delve into the details of the forecasts for each CPA, the forecasts might not always appear consistent with the history on home building over the last 10 years. The Housing Study includes charts of housing growth projections for the largest ten community planning areas. It also addresses reasons why the 2020 to 2050 forecast might appear different from the 2010 to 2020 actual period of housing production. In the case of San Dieguito, this occurs because of constraints associated with the marketable supply.[4]

The following chart which shows recent historical (2000-2020) and projected (2020-2050) housing unit growth in 5-year increments for the total unincorporated County area, is indicative of the projections for housing for each of the CPAs, excluding Otay.[5]

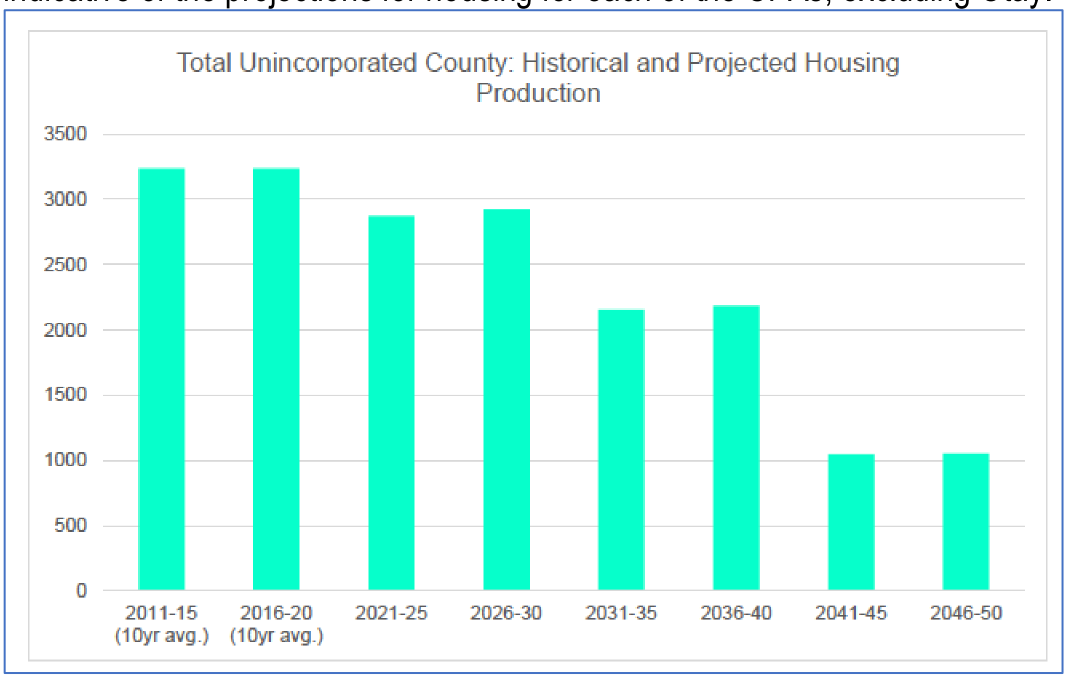


Figure 3: Housing Study projection of housing production, entire unincorporated area

The Otay CPA is programmed for greater growth in housing and commercial buildout over the 2020 to 2050 period than was built historically. Consequently, housing projections are highest in Otay than in other unincorporated county CPAs.

[3] See pages 21-22 of the Report.
[4] Report, page 28
[5] Report, page 66. The total unincorporated area is the sum of housing unit projections in the CPAs.

Employment projections

Employment is linked to housing growth. The historical number of jobs per housing unit in the unincorporated area of the county is 0.62, a ratio that has increased marginally since 2010. With the onset of housing growth, there will be an increase in population and in the demand for jobs by that population. The approach to forecasting employment by applying the historical jobs-to-housing rate is reasonable.

Higher demand for workers by employers in San Diego County will be filled by residents commuting from Riverside County in the north (and in particular Temecula and Murrieta), and Mexico to the south.

Historically, these two locations have been the source of significant additions to total San Diego County employment.

Alternative Corroborating Forecast

We produce a forecast of economic and demographic indicators for San Diego County every year. Using that countywide forecast, we produced a sub-county forecast for the unincorporated area of San Diego County.

Our independent forecasts could then be compared to the Report forecasts of population, housing units, and employment.

The comparison is made, not to ascertain which forecast is higher or lower, but to evaluate if the forecasts, each prepared independently and with different methodologies, ultimately generate similar (and therefore corroborating) results.

The forecast comparison is a validation of the reasonableness of the assumptions made and the data used, as well as the robustness of the methodologies.

Table of Contents

Report Peer Review

Introduction

The analysis by AECOM to generate a forecast for housing units, population and employment for the unincorporated Community Planning Areas of San Diego County follows a fundamental supply and demand approach.

Regarding the ability of the County to accommodate housing supply, not only is land the critical element, but buildable land or the feasibility of the land to facilitate housing production was a dominating factor of the methodology.

In summary, the forecast for housing determines population. But the forecast for housing or population is independent of employment. Our review first focuses on population, goes to housing supply, housing demand, and then onto employment.

Population

In the Housing Study, population per unit (or average household size) ratios over time are used to produce the population projection.[6] This assumption is both necessary and realistic in view of the actual trend over time in average household size for unincorporated San Diego County.

Data from the Department of Finance for the unincorporated area of San Diego County shows household population per occupied unit (or average household size) relatively steady over time, from 2.87 in the most recent year (2021) to a high of 2.96 back in 2004. (the red line in Figure 4. However, the simple ratio of population to all housing stock (the blue line), which is the relevant ratio for this study, represents a much more volatile and declining movement in the ratio over the same time period, from 2.95 to 2.77.

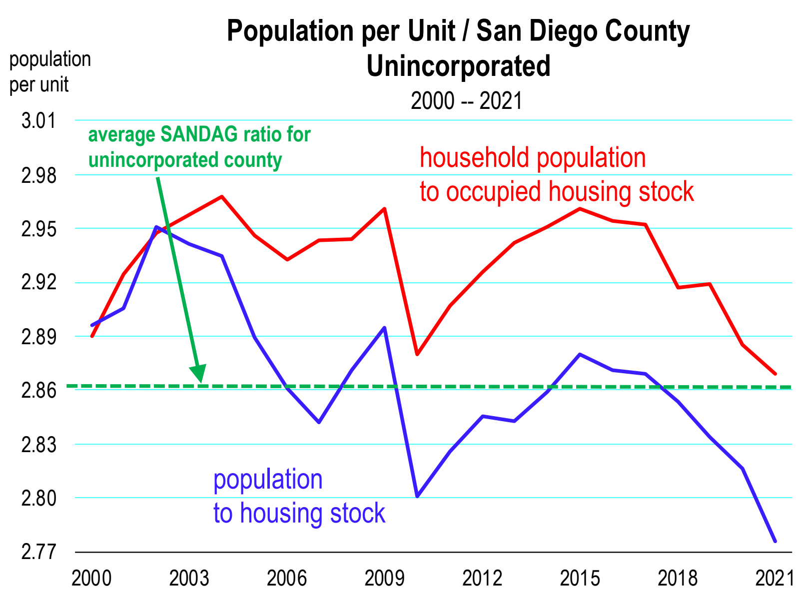


Figure 4: Household size / San Diego County Unincorporated

[6] Page 17 of the Housing Study

For either measure, the trend in the series' is decidedly lower. A lower ratio (holding housing stock constant) would lead to a lower population forecast over time.

Consider these scenarios of population per unit ratio:

High Growth Housing unit projection: 23,431

Population per unit	Population forecast
2.86	67,013
2.72	63,695 (Report forecast)
2.60	60,921

The resulting effect of varying assumptions about the household size ratio result in meaningful changes to the population forecast, if the housing unit projection is held constant. The Report correctly incorporates diminishing average household sizes over time in the projection of population through 2050.

Household sizes are likely going to move lower over the next 10 years in tandem with an aging population. Our forecast of average household size for San Diego County (completed for Cal Trans last September 2021) is shown in Figure 5. The ratio of population to housing stock declines over the entire forecast. This is consistent with most of the coastal county projections in California. The decline occurs because population growth slows faster than housing growth, households are getting older, and fertility rates continue to decline.

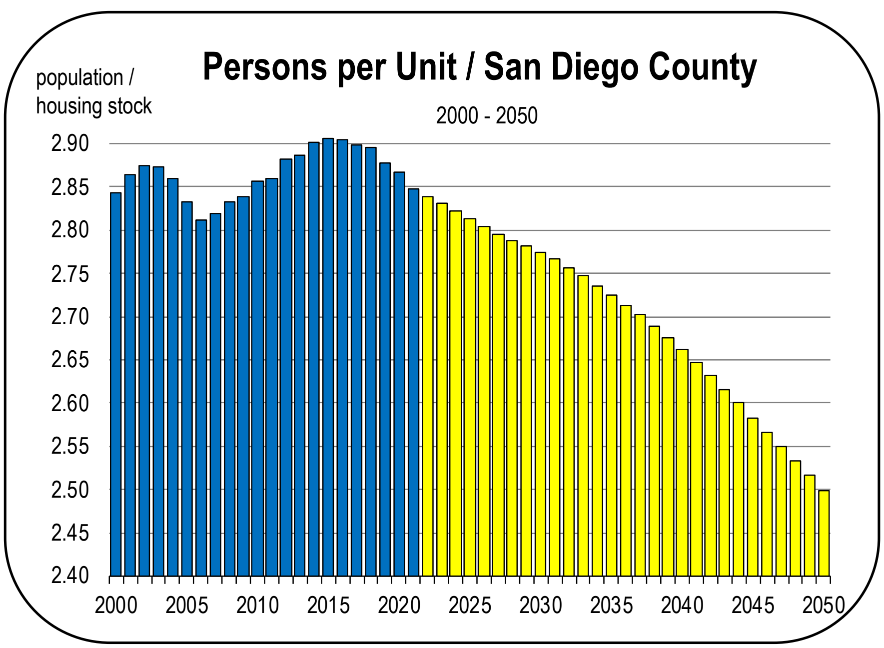
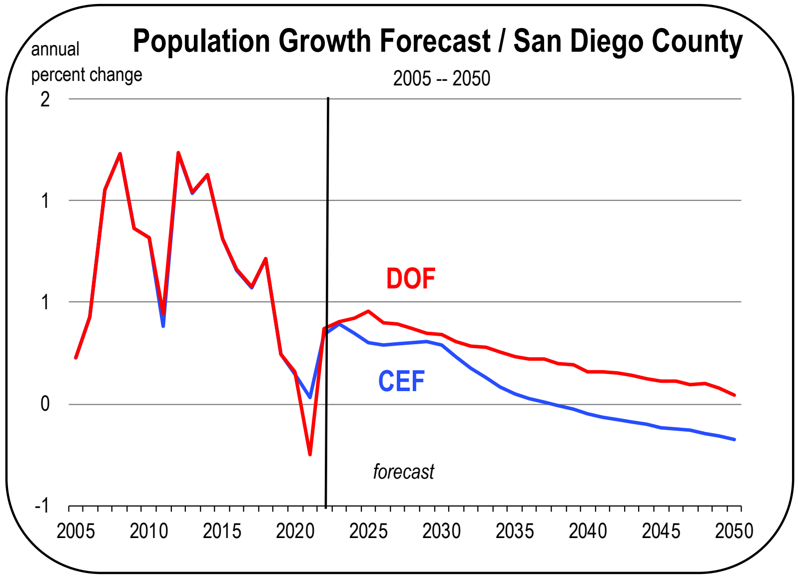


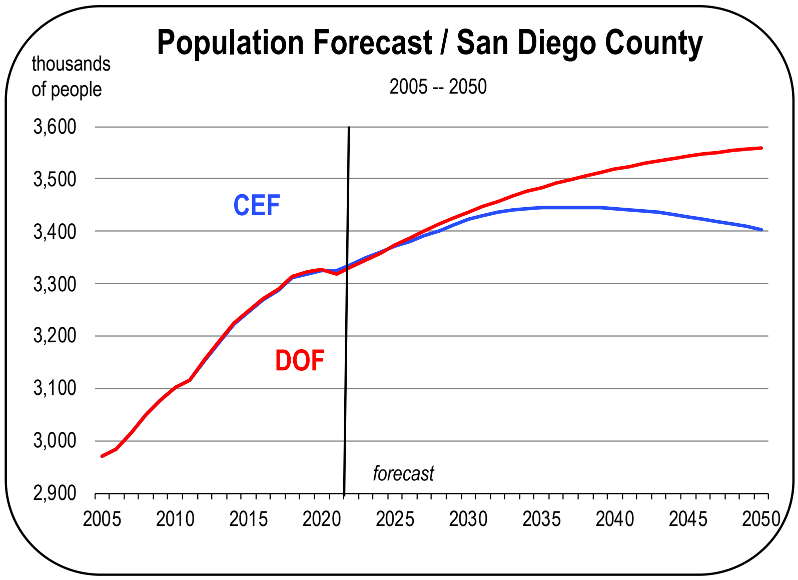
Figure 5: Household size - actual (blue) and forecast (yellow)

Our own population projection (CEF) shows a modest increase over time in San Diego County, that is actually lower than the latest Department of Finance (DOF) forecast. The population forecast for San Diego County is led by a rising fertile age population through 2035 producing a positive natural population increase.[7],[8]

The Report's population projection for unincorporated San Diego County is originally dependent on the Department of Finance projection for the County and/or entirely dependent on housing supply.[9] Consequently, our principal scrutiny focuses on the housing production forecast over time.

We provide a direct comparison of the population forecast from the Report with our forecast in the last section of this report.





Figures 6 and 7: Population Growth and Level for San Diego County

Housing Supply

The Report takes the approach that residential unit production over time is limited by the marketable supply of feasible development sites in the unincorporated areas of San Diego County.

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[7] After 2035, net out-migration is strong enough to offset a shrinking though still positive natural increase and population is therefore forecast to decline. The DOF series also has the natural rate turning negative but their net migration forecast remains significantly positive for the entire period through 2050, a trend that defies history.

[8] Housing stock increases slightly faster than population in view of the potential for continued high rise development in downtown San Diego, ADU units, more housing in the North Metro area and in the Chula Vista sphere of influence.

[9] See section 4.1.2 on page 13 of the Report.

The determination of the feasible, qualified, or marketable set of housing starts with the "Base Set" of all residential parcels in the unincorporated area. The data originate with the County Assessor.

A "Qualified Supply" of development sites was determined from a myriad of screening criteria. These criteria, used to establish a potential (called "marketable") inventory of residential development units, are discussed and described in detail on pages 13-16 of the housing study. A relatively elaborate filtering process was devised to qualify the Base Set of 180,000 potential buildable units as indicated by the General Plan, as marketable. What ultimately is buildable after application of the filters results in about one-third the number of the General Plan units, the Base Set, or the total unit capacity.

Application of the filters reduced the Base Set to 59,938 units.

As part of our principal review, we indicated that we would:

Evaluate the myriad of assumptions associated with the filters that constrain the base set of residential capacity through 2050.[10] *A principal question we have is do these filters truly limit future capacity ?*

We reviewed all of the filters. Their application appeared to be consistent with feasible marketability criteria including :

(1) access to infrastructure
(2) where land values would not support improvement
(3) where parcel sizes were not sufficient in size to support the prescribed zoning
(4) where parcel slope was too steep, and
(5) where capacity was eliminated because of long term inactivity in specific plan areas.

In answer to our principal question: Is capacity truly limited, the exercise did not result in a substantially reduced "qualified supply" that would meaningfully interrupt housing demand. The nearly 60,000 units that emerged as marketable capacity after the filters were applied represent a large enough volume of potential supply that should not constrain future plausible housing development in the unincorporated area. This is because under any reasonable scenario, this many housing units would not be built because projected population growth would never support this quantity. How do we know? Because historical

[10] The Initial questions that we had concerned the assumptions made about the myriad of Marketable Site Supply filters, including the financial feasibility filters, those associated with the specific plan areas, and the exclusion of entitled projects because of "inactivity," or the non-consideration of ADU units.

population growth in the unincorporated area of San Diego County shows a diminishing trend that appears to be structural and not cyclical.[11]

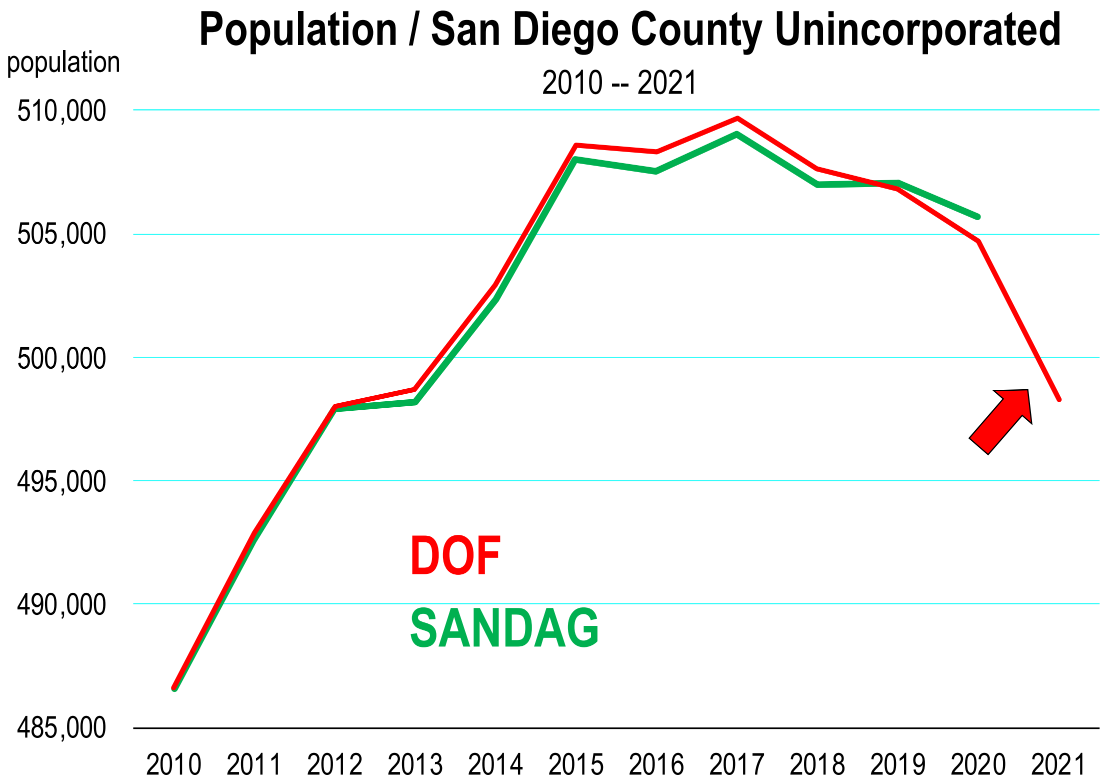

Figure 8: San Diego County unincorporated area population
Source: SANDAG and Department of Finance, 2021

Furthermore, the factors that have led to a decline in population in the unincorporated area of the County are not anticipated to reverse. As we demonstrated above, population forecasts by the Department of Finance and ourselves show diminishing population growth over the indefinite future, resulting in total population levels that would accommodate much lower housing production, of about half of the marketable or qualified capacity that was estimated in the Report. Consequently, this part of the study's methodology should pose no effective constraint on the housing forecast.

However, a constraint might be reached if the qualified supply in a particular CPA limits the number of units that are projected to be demanded in that CPA over the forecast. Demand is based originally on population, total units, and then historical allocation to each CPA. In the interests of transparency, the authors of the Report have addressed this with an

[11] It is "structural" due to age demographics, a steadily declining fertility rate, a corresponding decline in the natural population increase (births less deaths) and continuing low or negative net in-migration. See Appendix A.

appendix providing visuals of actual housing units produced and the 2020-2050 forecasts for the ten largest CPAs, and narrative indicating how housing growth is allocated to each CPA.[12]

Accessory Dwelling Units (ADUs) and Duplexes

California legislature AB345 was approved on September 28, 2021 by the Governor. ADUs now have the potential of becoming a significant issue for housing development going forward, The extent of what can be built under much less stringent local zoning criteria may have meaningful potential to augment total housing supply in many areas of California, including the unincorporated area of San Diego County.[13]

Commensurate with AB345, SB9 was also signed into law by the Governor. It allows for only ministerial approval of housing development of two dwelling units (duplexes) on sing-family zoned parcels. It also allows for lot splits and therefore up to 4 homes per original parcel.

The unincorporated area is more accommodative of single family detached housing under traditionally lower density conditions. Demand for ADUs may or may not represent a meaningful factor. The Report authors have addressed this issue with a Note on ADUs where the significance of them for the future is principally dismissed based on anecdotal evidence, and assumption.[14]

Housing units for the Unincorporated County and the Community Planning Areas

The methodology for determining housing units in the unincorporated area follows a particularly granular approach. The determination of housing demand for the entire unincorporated area of the County is a bottoms up approach, occurring by CPA based on a myriad of factors. The housing demand for each of the 24 CPAs is then summed or aggregated to yield the unincorporated total. It is that unincorporated total that provides the most credible basis for our review.

Total units for the unincorporated area are determined using the Base forecast for population. Over the 30 year period 2020 to 2050, population is forecast to rise by 34,829.

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[12] See page 27 in the Report, and appendix pages 66 to 71.
[13] While San Diego County may have an ADU ordinance that predates AB345, the new law is much less restrictive and negates many local zoning ordinances, making it easier for homeowners to build an accessory unit.
[14] See pages 21-22 in the Report

This increment to population principally comes from the forecast of San Diego County population produced by the Department of Finance.

The housing unit forecast for 2050 is derived from the need by this population for housing. If there are an average of 2.85 people per house over the forecast period, then housing need or demand is determined by:

35,183 / 2.85 = 12,239

If the average household size declines faster over time, then the housing need will rise. Conversely, if it rises, the housing need declines.

We originally recommended that the base forecast incorporate a declining average household size over time. The 2020 ratio based on actual data is 2.86, and the previous data back to 2015 show much higher ratios of people per unit. Figure 9 presents the persons per housing unit ratio for the unincorporated area from 2010 to 2020 and how that ratio moves over the forecast in the Report. The authors state:

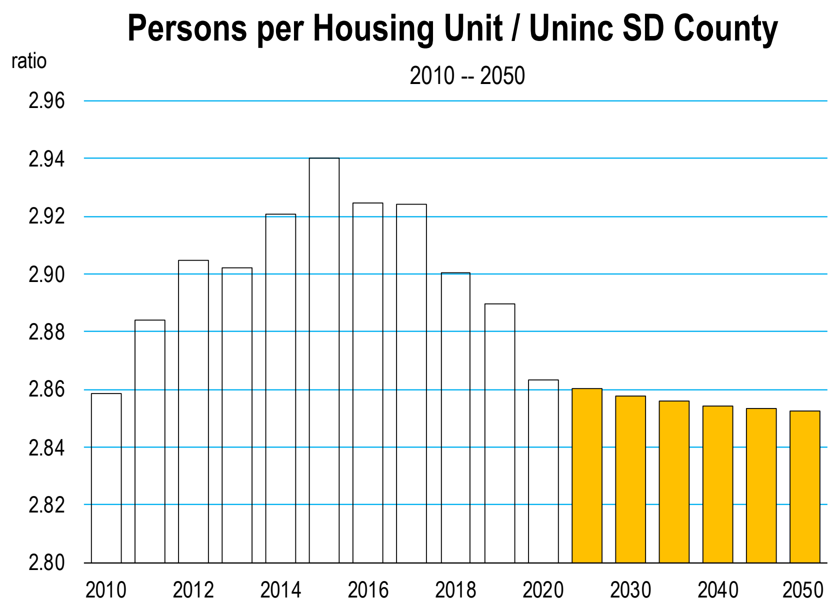

Figure 9: Average Household Size, Unincorporated San Diego County
Source: SANDAG, San Diego County PDS, California Economic Forecast

> . . . . . household sizes overall are expected to continue to decline as falling birthrates lead to smaller families and an aging overall population. To reflect this future decline, the housing projections assume a falling population/unit rate . . [15]

Due to demographic trends, there is a likelihood that the ratio will continue to decline at a faster rate than the Report forecast implies, as part of the longer term trend that has been in place since 2015, This is the case in our countywide forecast shown in Figure 5 above.

[15] Page 17 in the Housing Study

This is a consideration that the authors of the Report do acknowledge. Looking at how the population-per-unit ratio moves for a random sample of five CPAs, it is clear that the ratio declines over time, albeit minimally for the Spring Valley CPA.

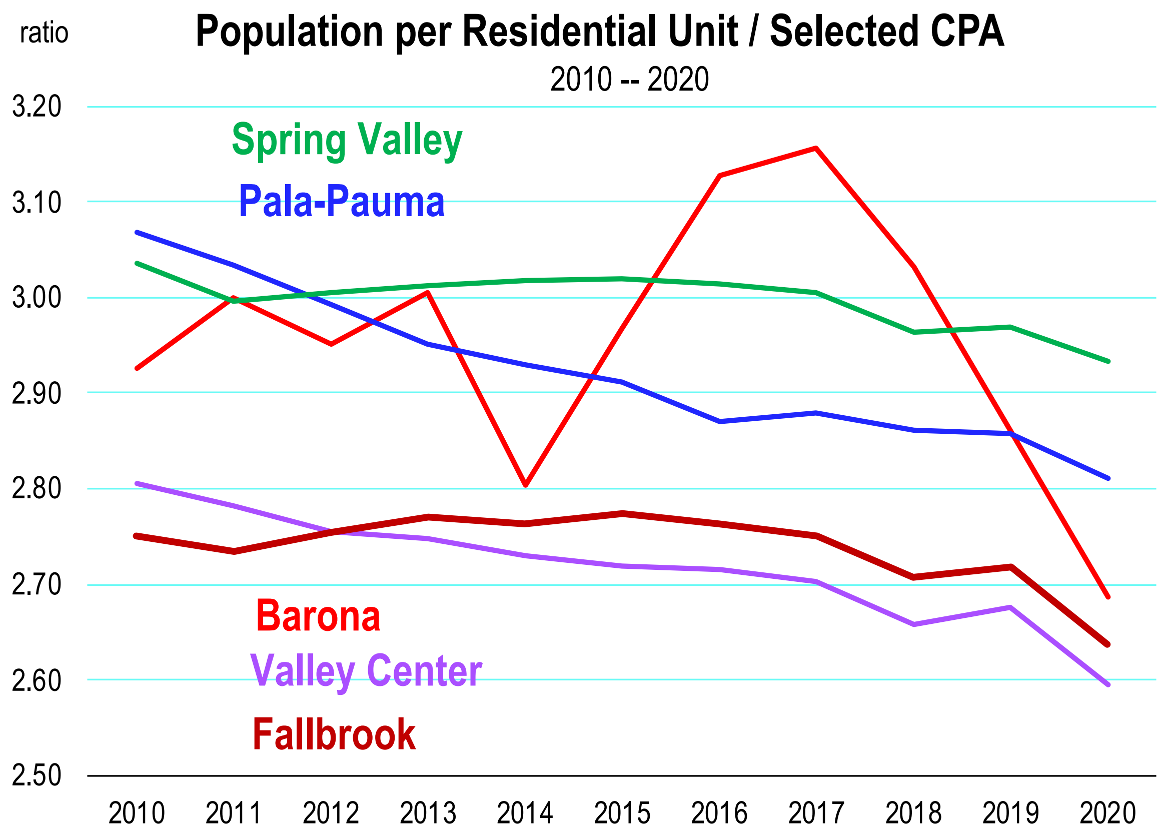

Figure 10: Average Household Size by Selected CPA

The 12,239 units that are forecast to be produced over 30 years to 2050 are allocated to each CPA by application of the population per unit specific to each CPA. The Population forecast for the CPA is the fair share of the unincorporated total population forecast, shown above to be 35,183

The housing units for each CPA are further adjusted by a myriad of factors including zoning and Specific Plan Area units that are entitled and likely to be built. This “likely to be built” is based on one evaluation by AECOM which tends to be conservative. However, because the High Growth Scenario provides an alternative higher production of housing units, a range of likely housing units to be built defines a broader range for the housing forecast.

We are not concerned with the allocation of total units by density category. The housing study determined how housing production in a particular CPA would be distributed based on zoning and historical precedent. This is a reasonable approach.

Appendix B presents the visual representation of the housing forecast for the 10 largest CPAs, and Otay. In most cases, the forecast of new housing per year appears consistent with historical precedent combined with the general trend of diminishing population growth (which is indicative of the entire county---both incorporated and unincorporated).

Over the last 10 years, the number of new residential units per year averaged 204 in the San Dieguito CPA. However, the forecast of housing averages 42 units per year from 2021 to 2050. The Spring Valley, Pendleton, and Alpine areas appear to have a more auspicious forecast for housing than their recent history would by itself predict. The authors of the Report do explain these potential anomalies, specifically illustrating the case for the San Dieguito CPA.[16]

Otay is the only “oddball” case. Curiously, no housing units were built over the 2010 to 2020 period, but thousands are forecast for the 2020 to 2050 period. Clearly, the forecast is supported by SPA capacity and current active project momentum there. The Report pays considerable attention to this in describing the current and future buildout potential in Otay.[17]

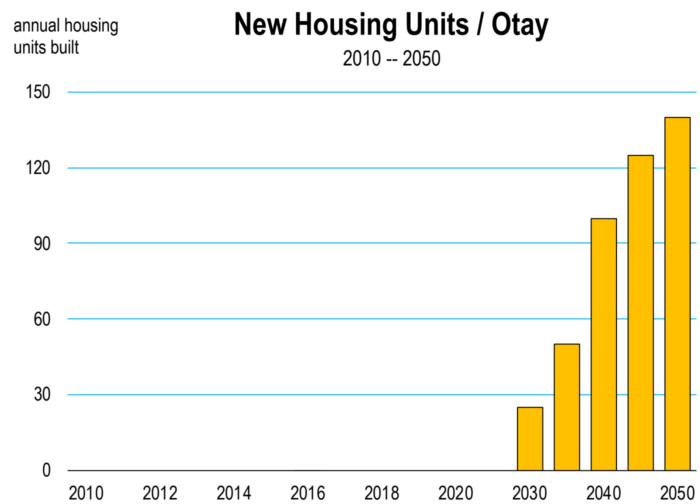

Figure 11: Annual Average Housing unit forecast for Otay

High Growth Estimate

The High Growth estimate adds all SPA housing unit capacity (that was omitted from the Base Growth scenario) back into the CPAs with the assumption that SPA units are entitled, feasible, marketable, and less likely to be blocked by lawsuit or new obstructive housing policies in the future.

An increase in supply would normally be absorbed by a reduction in price. There would not necessarily be an offset to other area housing if additional housing could be expanded.[18]

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[16] Page 28 of the Housing Study
[17] Pages 10 and 22-24 in the Report.
[18] However, housing prices would likely have to decline precipitously for demand to materially increase. This is not likely in view of production, land, labor, and entitlement costs indicative of the home building environment in California.

While we agree that the Base Growth and the High Growth scenarios form a reasonable range of potential outcomes, we also understand that the High Growth boundary could go higher, rather than represent an effective *upper bound* of housing unit growth projections for the unincorporated area of San Diego County. However (1) population growth would have to increase, and/or (2) home prices would have to decline.

Neither of those conditions is forecast to occur short term or long term.

Consequently, a materially higher growth scenario for housing is not likely. Therefore, while we are not advocating for a change to the High Growth Scenario, we understand that it represents a relaxation of an assumption that would offer more supply to the marketplace, as would a faster decline in the population-to-housing unit ratio over time, or an alternative higher growth forecast for population.

One of the principal arguments being made in California today is that populations are leaving California in record numbers, due largely to the lack of affordable housing. Figure 1 clearly demonstrates this. The SANDAG forecast for population from which the demand for housing is based, assumes this trend will continue over the long run. For planning purposes, this assumption is fair, but subject to valid debate nevertheless.[19]

Employment Projections

The Report uses the more inclusive definition of employment for unincorporated San Diego County and all of the Community Planning Areas. This aligns more closely with the conventional employment data series generated monthly and annually by the State of California.[20]

The employment forecast (Figure 12) is a plausible extension of the historical change in employment over time (green arrow versus purple arrow), accounting for a slower population growth forecast and a slower employment growth that aligns with the greater countywide forecast (Figure 13).

[19] See any number of sources for this: https://www.movingapt.com/top-reasons-why-people-are-moving-out-of-california/
https://www.movingapt.com/top-reasons-why-people-are-moving-out-of-california/
https://www.cnbc.com/2018/03/19/californians-fed-up-with-housing-costs-and-taxes-are-fleeing-state.html
[20] Labor Market Information Division, Employment Development Department. Data for San Diego County and all counties can be found here: https://www.labormarketinfo.edd.ca.gov/data/employment-by-industry.html

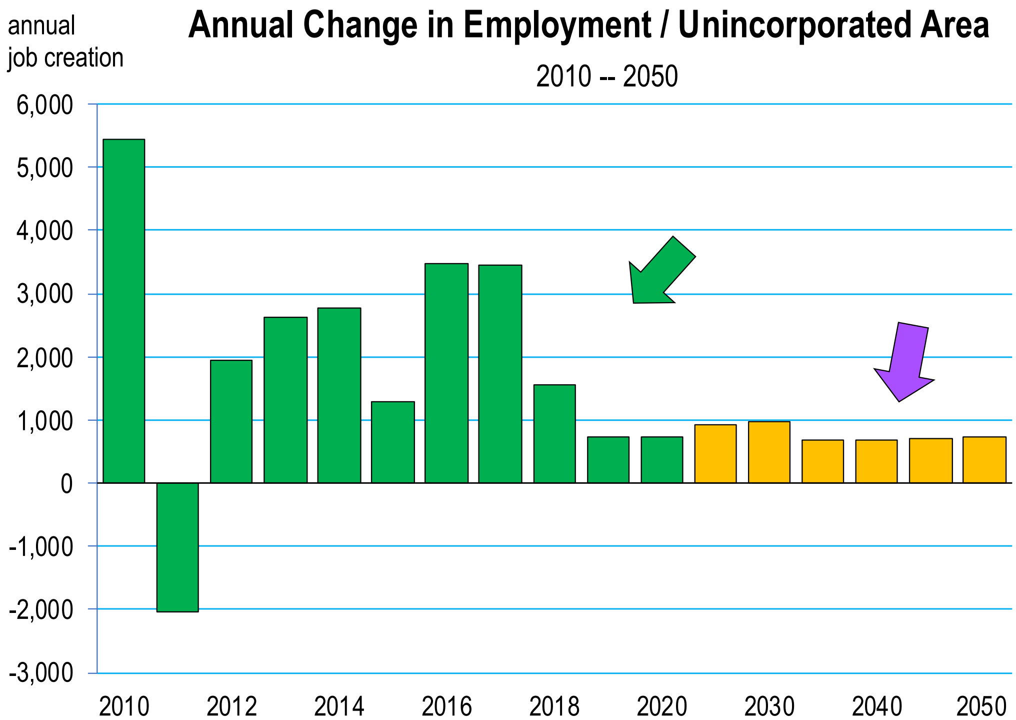

Figure 12: Unincorporated San Diego County Employment Change through 2050

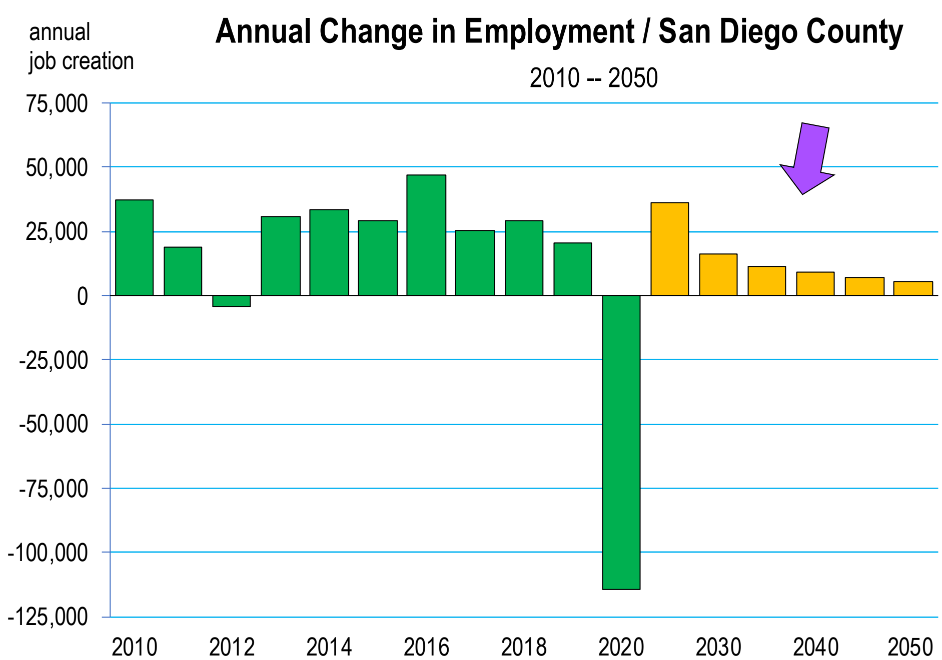

Figure 13: San Diego County Employment Change through 2050

Consider that from 2010 to 2020, the unincorporated County created 16,508 jobs while the entire County created 116,095. The unincorporated County represented 14.2 percent of total job creation in the County over this time period.

From 2020 to 2050, the unincorporated County is forecast to create 26,157 jobs in the High Growth Scenario while the entire County is forecast to create 430,650 jobs. The unincorporated County represents 6.1 percent of total job creation in the County over the forecast. Consequently, the historical share by the unincorporated County is low compared to job creation historically.

This result can be explained by a number of factors, including constraints on marketable capacity of new housing, the decline in population growth, an aging population, and less demand for workers over time due to slowing population growth and technology.

The Housing Study uses the actual unincorporated jobs to housing ratio for 2020 as the basis for the employment projections in each CPA:

Employment in CPA(I, t) = J/H ratio(i) * HUP(i,t)

where i = 1 to 23 CPAs (excluding Otay), t = time: 2020 to 2050
J/H ratio(i) = jobs to housing ratio for each i that prevailed in 2020
HUP(i,t) = housing unit production for each ith CPA over t

and

∑ Employment in CPA(i) over all i + Otay employment
total employment in the unincorporated area

Otay employment was projected independently based on a myriad of factors associated with the auspicious growth potential for the region.

This approach to employment projections is reasonable because it is congruent with the population and housing projections. Methodologically, they are linked. The assumption of a constant jobs to housing ratio over time could be debated but does not effectively produce a materially different employment forecast if relaxed over a reasonable range of possible values.

Alternative Independent Forecast of Unincorporated San Diego County

We have presented an alternative forecast for San Diego County, and in particular, the unincorporated area of the County, for population, employment, and new residential units, including the attendant (and cumulative) housing stock from 2021 to 2050.

The forecast is produced using our long term econometric model for San Diego County. The model has been operative and producing forecasts for San Diego annually since 2000, as part of our annual assignment for the California Department of Transportation.[21]

The model used here has been updated with recent 2021 data and a more recent exogenous forecast from the UCLA Anderson Forecast, reflecting the long term economic forecast trend for the U.S. and California.

Population

The forecast of population at the county level is derived from the following accounting identity:

Pop(t) = Pop(t-1)+B(t)-D(t)+NIP(t)

Where Pop = population
B=births
D=deaths
NIP=net in-migrating populations
t = time period t

Population this year is equal to population last year plus births occurring last year to this year minus deaths occurring from last year to this year plus new net migrants coming into the region from last year to this year.

NIP = net migrants = gross migration into the county less gross migration out of the county

The components of that identity are individually forecast in the larger San Diego Countywide econometric forecasting model. The general specifications for the components of population are as follows:

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[21] The last 3 years of the forecasts for every county in the state can be found here: https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/data-analytics-services/transportation-economics/long-term-socio-economic-forecasts-by-county

Births = f(population aged 25 to 44, birthrate in California)
Deaths = f(population aged 75 and over, deaths last year)
NIP = f(job opportunities, the unemployment rate, housing stock)
f(*) = some mathematical function or relation of, measured with error

The birth forecast is driven by the fertile age population and the general trend in the overall state birthrate over time. Deaths is driven by the oldest age population. Net migration responds to economic factors in the county, including employment growth, the rate of unemployment, and the growth of housing.

The forecasts are shown here.

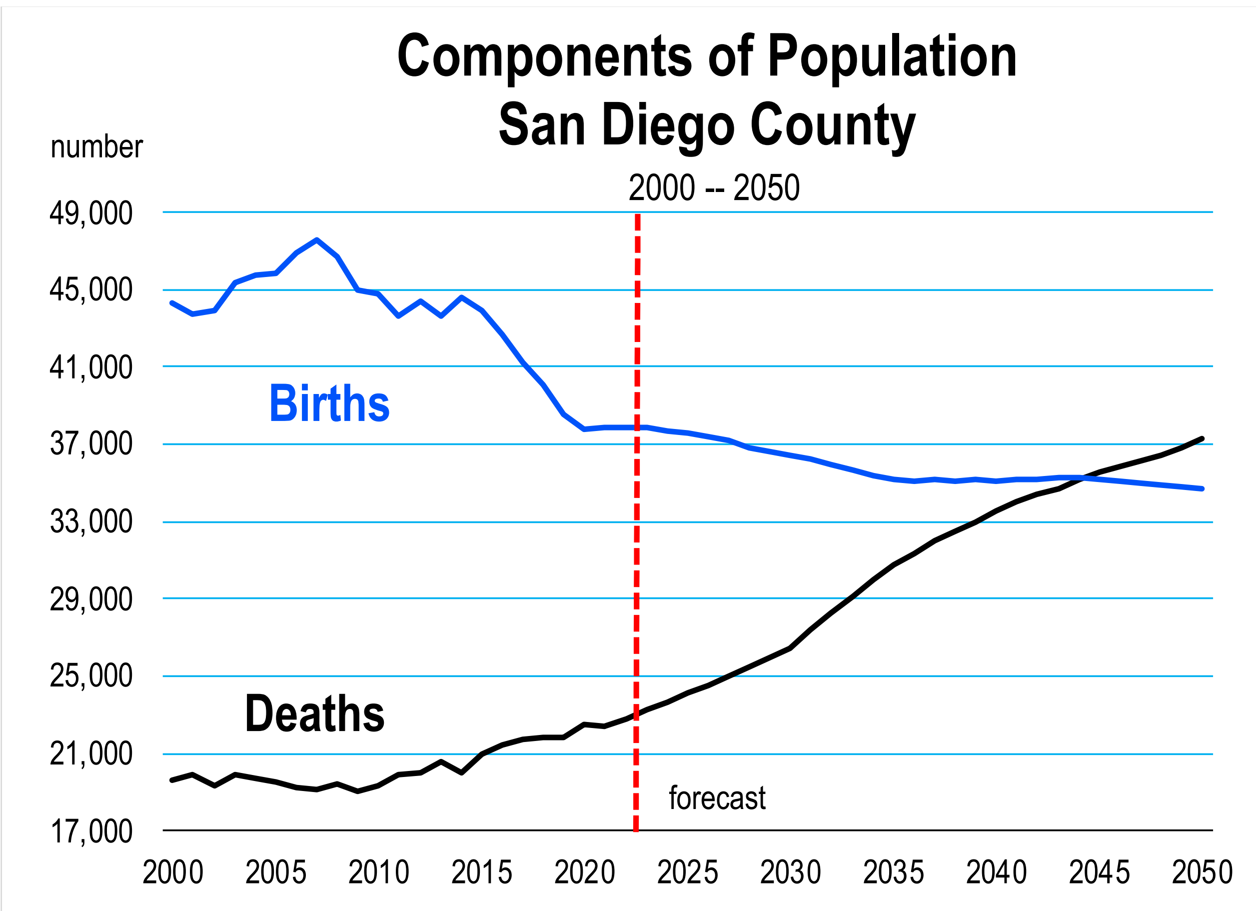


Figure 14: San Diego County Births and Deaths, History and Forecast through 2050

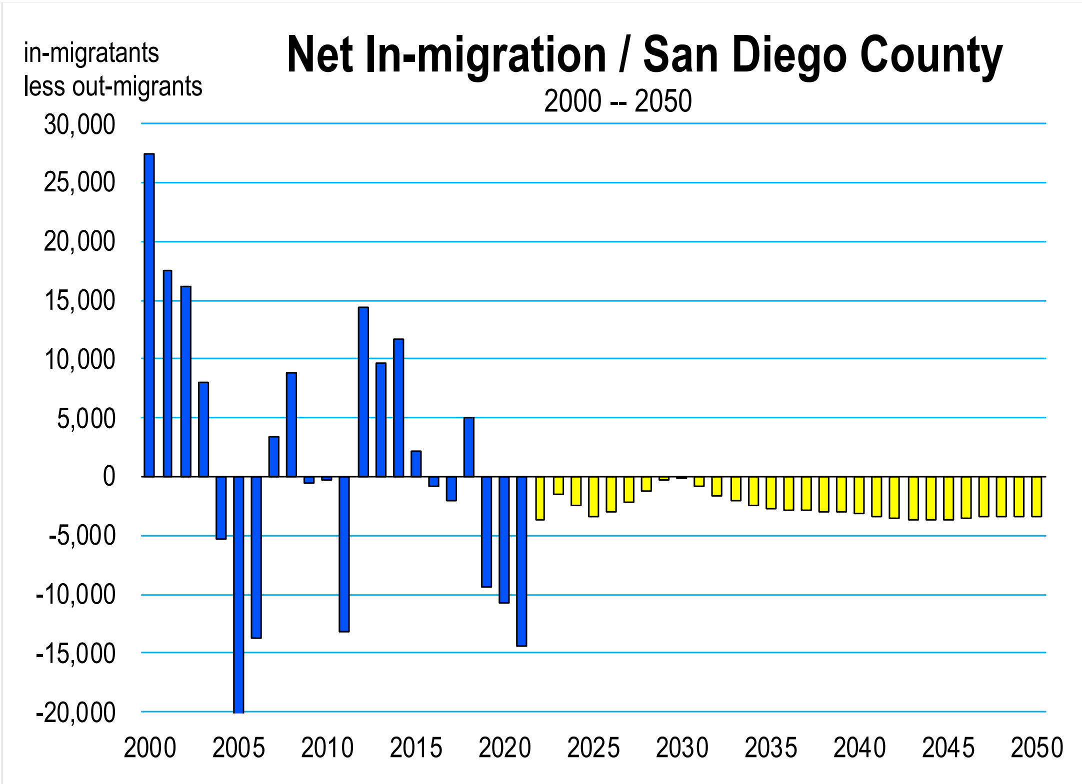


Figure 15: San Diego County Net In-migration, History and Forecast through 2050

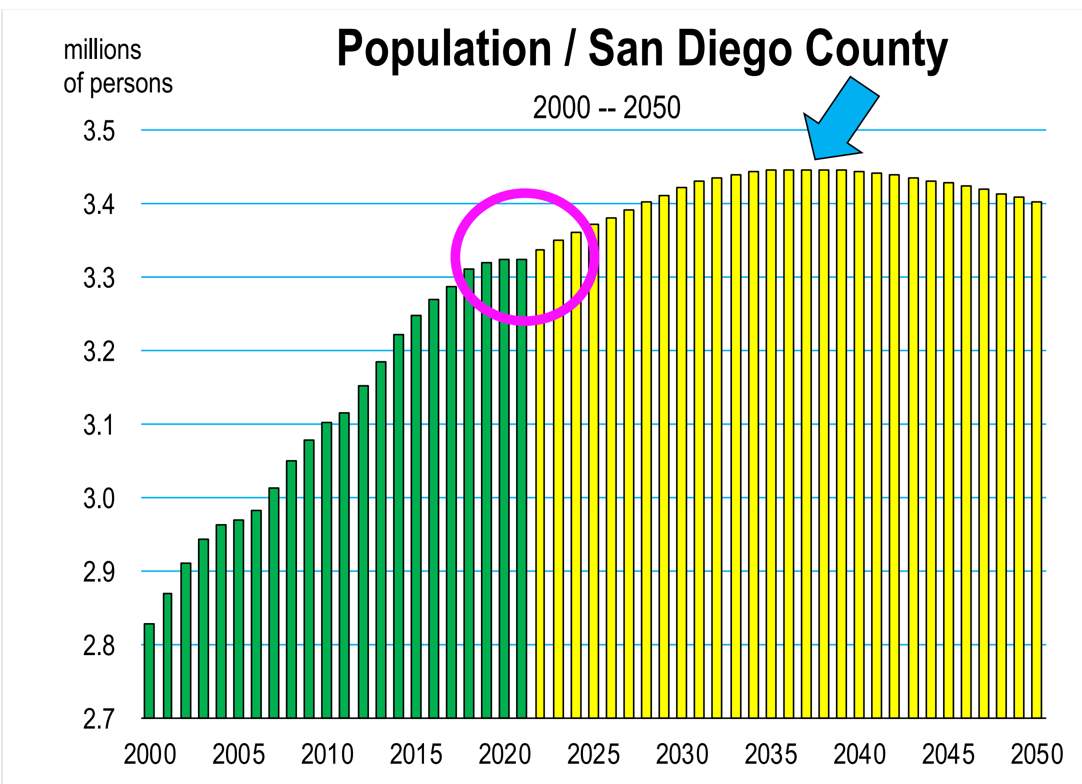


Figure 16: San Diego County Population, History and Forecast through 2050

The resulting population forecast is shown above in Figure 16. The diminishing growth in population observed in 2020 and 2021(**purple circle**) is due to the pandemic's impact on (1) disabling new migration into the county, and (2) increasing deaths. With recovery of the economy in 2022 and beyond, population growth improves principally because the level of out-migration subsides (Figure 15).

The **blue arrow** shows the point at which population growth goes to zero in the County, due principally to the decline in the natural rate of population growth as the number of deaths is converging on births and net migration remains negative. This occurs in the year 2038.

Our forecast of county-wide population (CEF) is lower than the Department of Finance forecast of the 2020 to 2050 time period (see Figure 7 on page 3), principally due to the net migration component.

The DOF forecast (DOF) is positive averaging 6,800 net migrants per year for 30 years. Yet over the previous 10 years, net migration in San Diego County averaged only 729 people per year. Our forecast (CEF) of net migration is an extension of the downward trend that has been in place since 2014. Out-migration was heightened by the pandemic in 2020 and 2021, but also by sharply rising home prices. The net migration forecast for 2022 and beyond fstays negative, consistent with lower population growth in general in California, less housing, much less affordable housing, fewer jobs, and a generally slower economic growth forecast.

The two juxtaposed forecasts are presented in Figure 17.

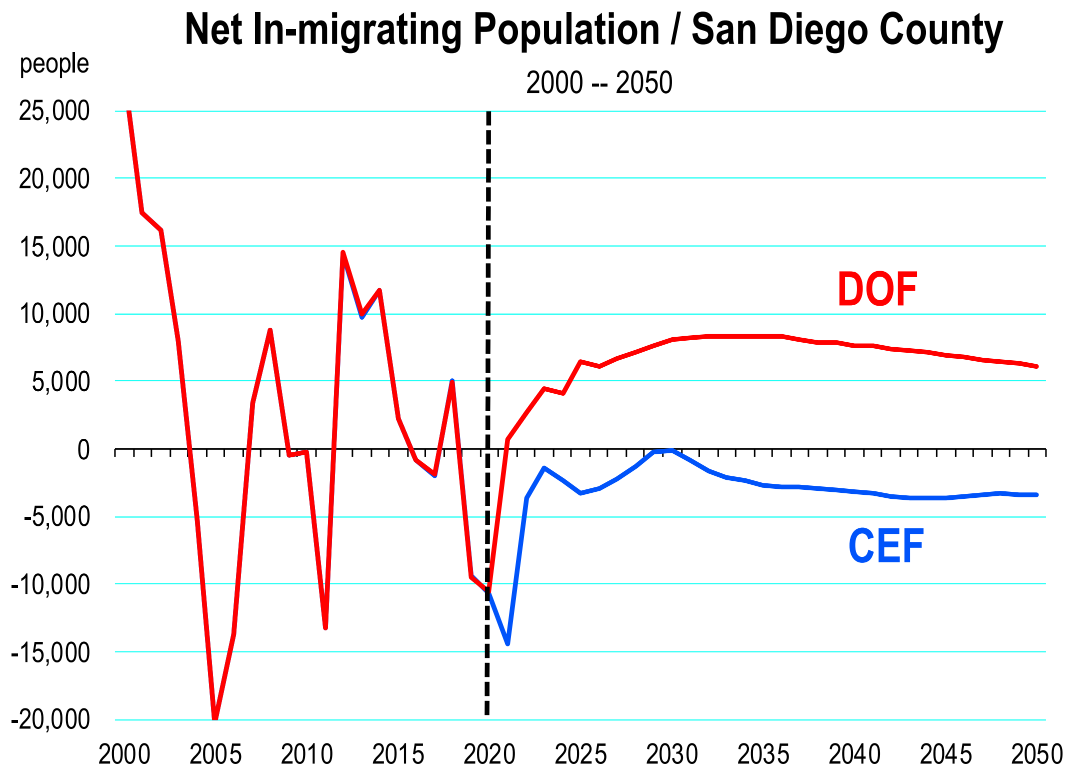


Figure 17: San Diego County Net Migration Forecast: CEF and DOF

As is the case for the entire state, population in San Diego County is likely to plateau during the forecast period, and gradually decline until natural population growth turns positive again.

Our county-wide population forecast is used to produce a forecast for the unincorporated area. The ratio of unincorporated population to total county population averages 0.156 over the 2000 to 2021 period, moving in a relatively tight range of between 0.150 and 0.158. Figure 18 shows this trend expressed in percent:

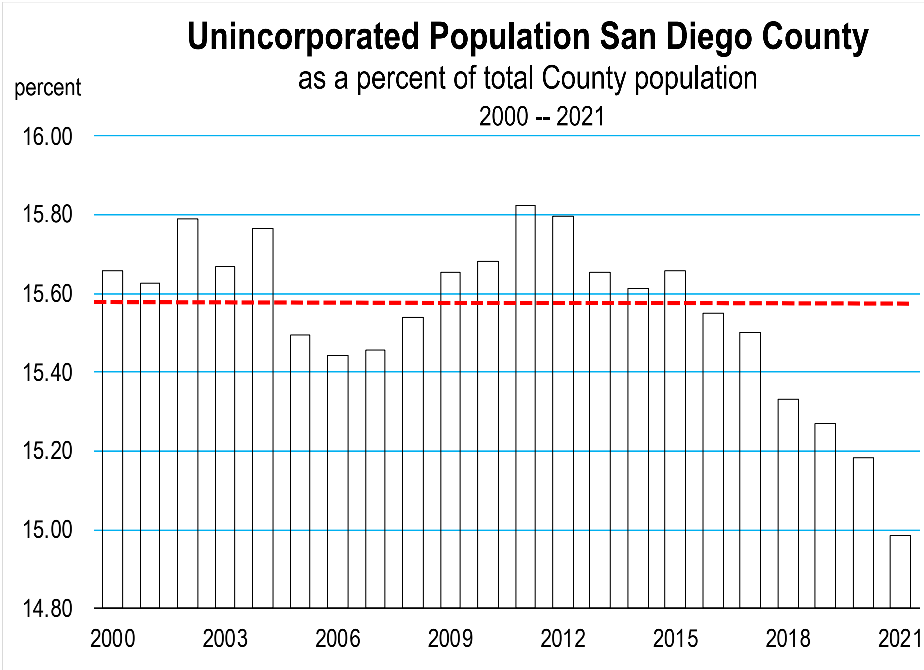


Figure 18: Percent of Total County Population in Unincorporated Area

The red line represents the 21 year average, or 15.55 percent. The proportion of the population in the unincorporated area of San Diego County was moving in a relatively constant manner through 2016, but has departed from that trend since then, declining at a relatively swift rate. This departure from the trend is either due to (1) actual slower growth of population in the unincorporated, area (2) relatively faster growth in the incorporated areas, or (3) measurement error of the unincorporated area population by SANDAG (and DOF) during inter-census years.

Actual slower growth for unincorporated San Diego County is clearly explicit in the most recent Department of Finance population estimates.

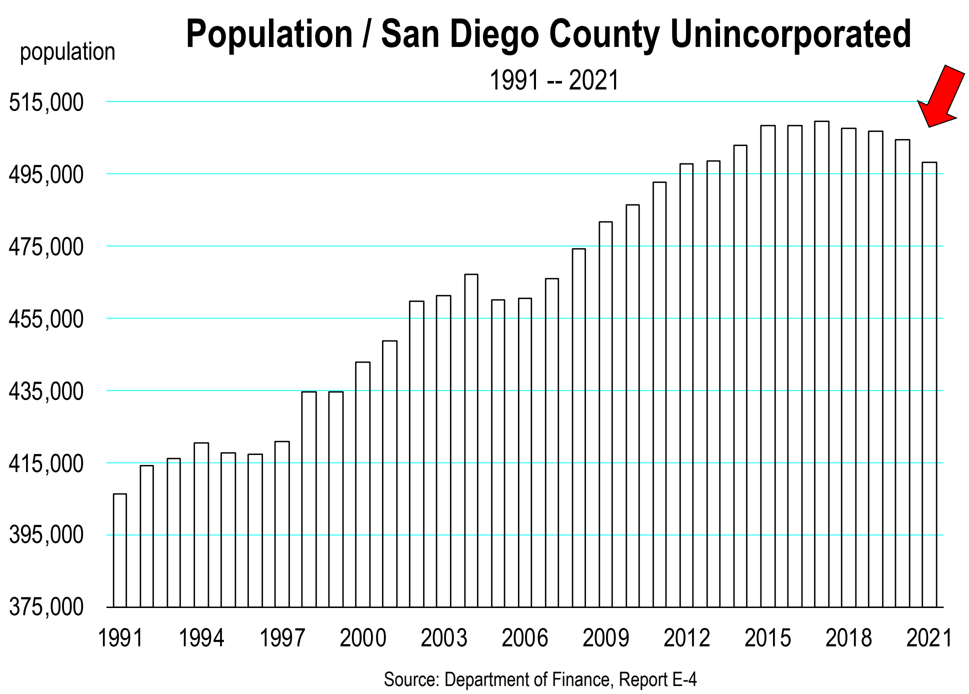


Figure 18: Percent of Total County Population in Unincorporated Area

Observing the ratio of unincorporated population to total county population over time provides us with information useful for constructing a regression equation to predict the unincorporated population. A constant ratio would imply that a simple linear regression of the unincorporated population against county population would generate a reasonable forecast. The fact that the ratio is not constant, deviating from 2016 onward (Figure 18), tells us that an adjustment to the regression equation is necessary.

In the absence of knowing the causal factors that caused the recent deviation, we include a binary variable into the regression that adjusts for 2017 to 2021 and then forward through 2050. This adjustment factor, which we label DUM17ON takes the value of 1 for 2017 to 2050 and 0 for the rest of the historical time period. The implicit assumption associated with adding this factor to the equation is that this deviation will persist through the forecast period.

The regression model is therefore:

Popuninc(t) = a + b*POPJUL(t) + c*DUM17ON(t)

Where Popuninc is the unincorporated population of San Diego County,
POPJUL is the population of San Diego County,
DUM17ON is the adjustment factor that captures and extends the 2017 to 2021 deviation in the growth of population between the unincorporated area and the entire county,
t = annual time, 2000 to 2021, and
a, b, and c are the estimated parameters or coefficients.

The results of the regression are very statistically sound, with a goodness of fit statistic (R^2) of 0.987.[22] The unincorporated county population moves in tandem with the county population forecast. The adjustment factor indicates that the unincorporated population trend will deviate from county population (as it had between 2016 and 2021) by an average of 9,663 people per year.

This equation is used to forecast the unincorporated population. The principal driver is of course the county population forecast. The forecast for the unincorporated population follows closely the countywide forecast of population.

[22] See Appendix C for the statistical results of the regression

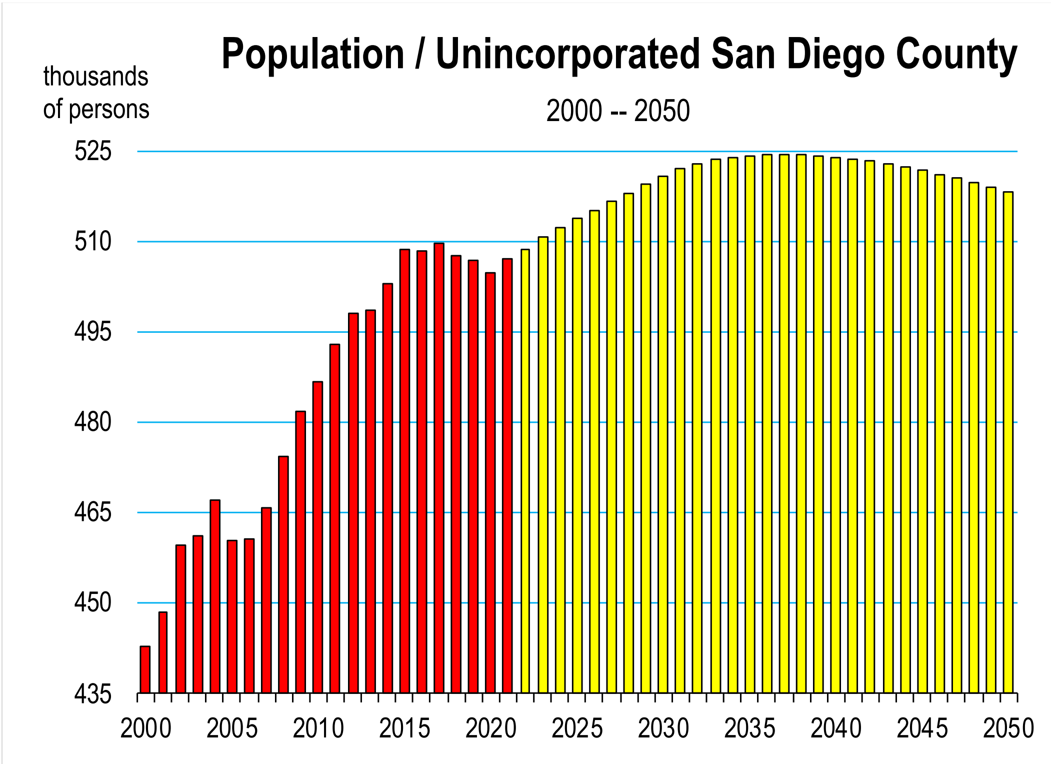


Figure 19: Percent of Total County Population in Unincorporated Area

Between 2020 and 2050, the unincorporated county population rises from 504,709 to 518,134, a net increase of 13,425 people. In the peak year, 2037, the population gain from 2020 is an increase 19,633 persons.

The annual change in this forecast series is shown in Figure 20. The forecast follows and extends the annual actual trend line **(in green)** that represents diminishing growth over time.

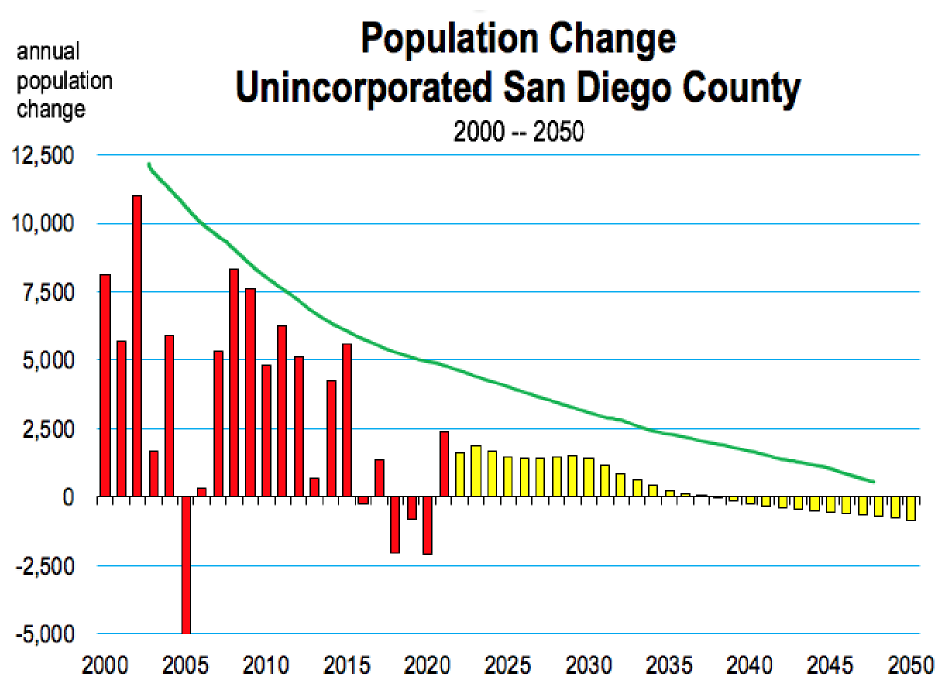


Figure 20: Annual change in the Unincorporated County Population

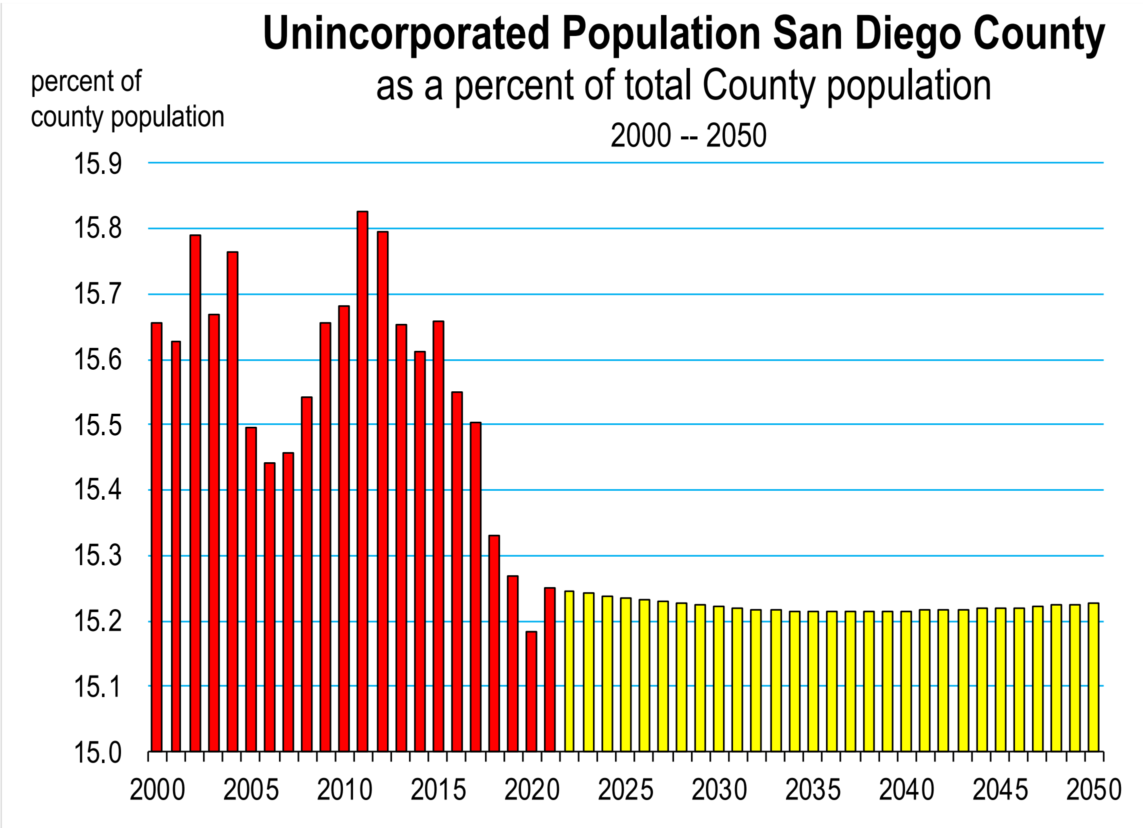


Figure 21: Ratio: population in unincorporated area to total county area, CEF Forecast

The ratio of the unincorporated population and the countywide population over the forecast is shown above in Figure 21. Our approach is tops down. The ratio of the Housing Study unincorporated population projection to the countywide Department of Finance population projection is shown in Figure 22. The AECOM followed a bottoms up derivation.

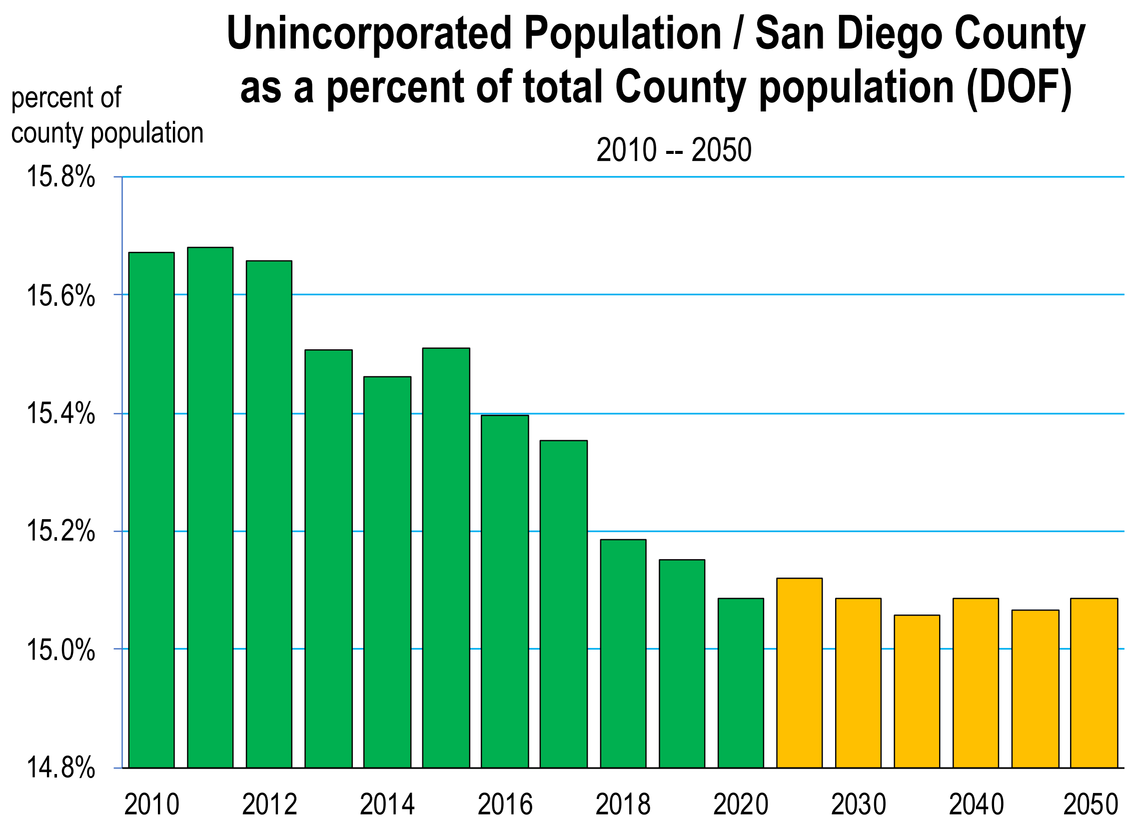


Figure 22: Ratio: population in unincorporated area to total county area, Report Forecast

Clearly, the forecasted ratios are similar, further validating the Report forecast of the unincorporated population, because the two independent forecasts behave similarly over time.

Our forecast (Figure 19) of the population and the incremental change from 2020 to 2050 in the unincorporated area of San Diego County, along with the forecasts from the Housing Study, are presented here:

Total Population and Incremental Population Forecast
Unincorporated San Diego County

	Report	California Economic Forecast
Actual 2020	505,675	505,675
Base Growth Case 2050	540,504	518,134
Increment 2020-2050	34,825	13,425
High Growth Case 2050	569,370	not estimated
Increment 2020-2050	63,695	not estimated

In summary, our population forecast peaks in 2037 due to the extent of net out-migration of county residents from both the incorporated and unincorporated areas, offsetting the natural increase in population, which eventually turns negative itself (Figure 14).

Housing Units or Housing Stock

Data for total housing stock was obtained from both the Department of Finance (DOF) and SANDAG. DOF data spans the 2000 to 2021 period; SANDAG estimates are from 2009 to 2020. The DOF numbers for the 2000 to 2009 period are less consistent with the subsequent 10 year period, whereas the SANDAG series with 5,000 fewer units per year than the DOF series, shows a less dramatic departure from the DOF series in 2010. Consequently, that is the series used in the forecast. It is also the series that AECOM adopted in the Report.

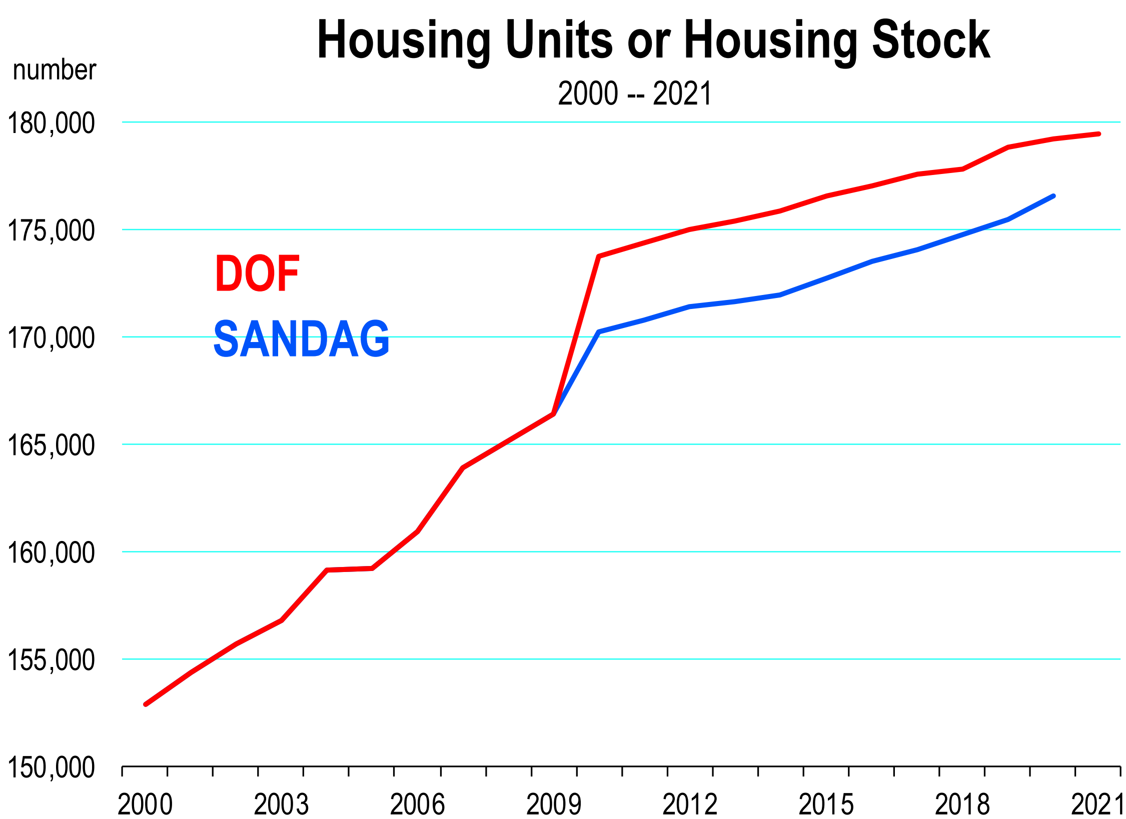


Figure 23: Total Housing Units (or Housing Stock)
Department of Finance and San Diego Association of Governments

The ratio of unincorporated housing stock to total county housing stock represents a relatively stable relationship over time (compared to population).

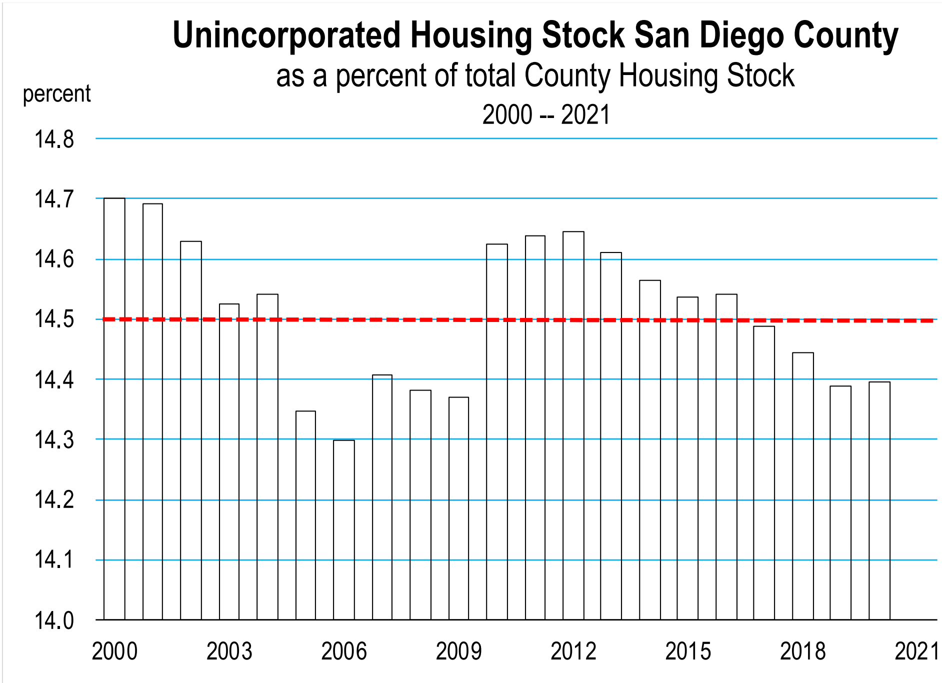


Figure 24: Ratio: Unincorporated Housing Stock to Total County Housing Stock

Note that over this series, because we are mixing the 2000 to 2009 DOF series with the 2010 to 2020 SANDAG series, there is a measurement error with housing stock, likely in the earlier period.[23]

The average value over the 20 year period is 14.5 percent (**red line** in Figure 24). We used the same approach in the housing stock forecast for the unincorporated area as the population forecast. A regression equation was constructed with the housing stock for the unincorporated area as the response or dependent variable, and county housing stock as the independent variable.

Because of the slight discontinuity in the data series beginning in 2010, an adjustment was added to the model as a compensatory factor.

The estimated regression equation is presented in Appendix C. The fit of the equation is 99.5 percent, implying that nearly all of the variation over time in the unincorporated county housing stock series can be explained by total county housing stock and the data

[23] Presumably, the 2001 to 2009 estimates for San Diego County housing stock were not backward-adjusted when the 2010 census estimate was released which indicated a higher level of housing stock than previously estimated from 2005 to 2009. You can see that year 2000 and the subsequent years' ratio estimates that are closer to the 2000 census year are more in line with the 2010 census estimate. The departure largely is limited to the 2005 to 2009 period.

adjustment. In other words, as the entire county goes, so goes the unincorporated area of the county. They move in lock-step.

The forecast is show in Figure 25. Total housing stock in 2050 is forecast at 199,144 units, or the addition of 23,679 units from 2021 to 2050.

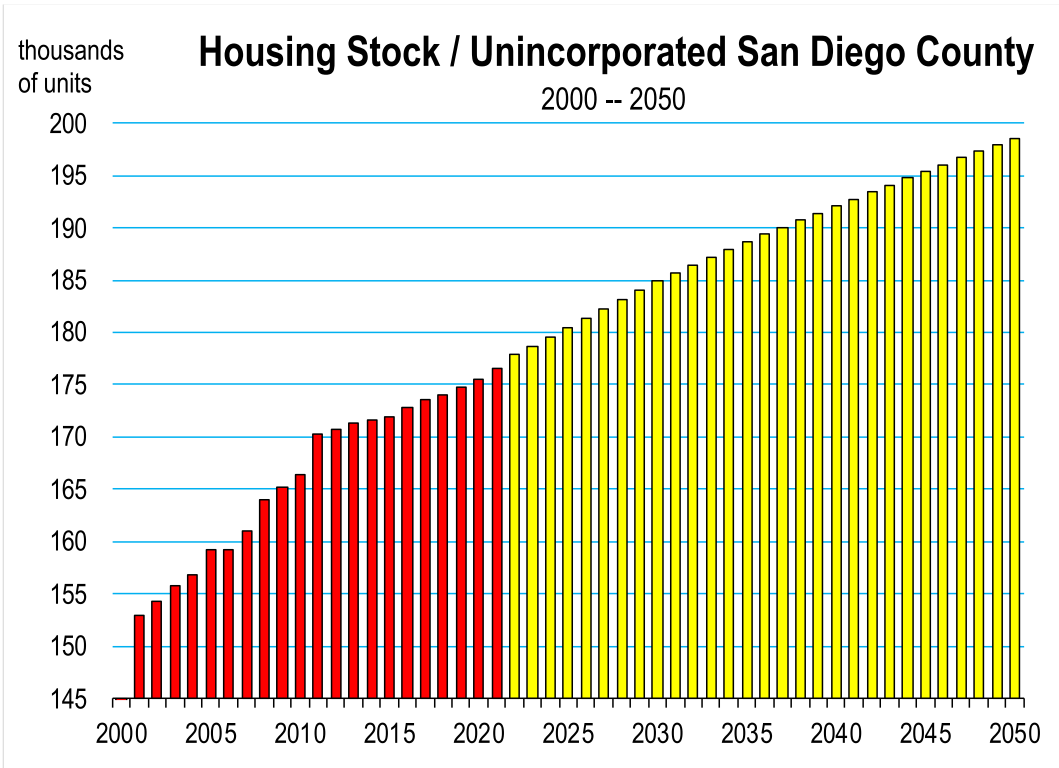


Figure 25: Ratio: Unincorporated Housing Stock to Total County Housing Stock

The change in the housing stock (or new housing stock units per year) is presented in Figure 25.

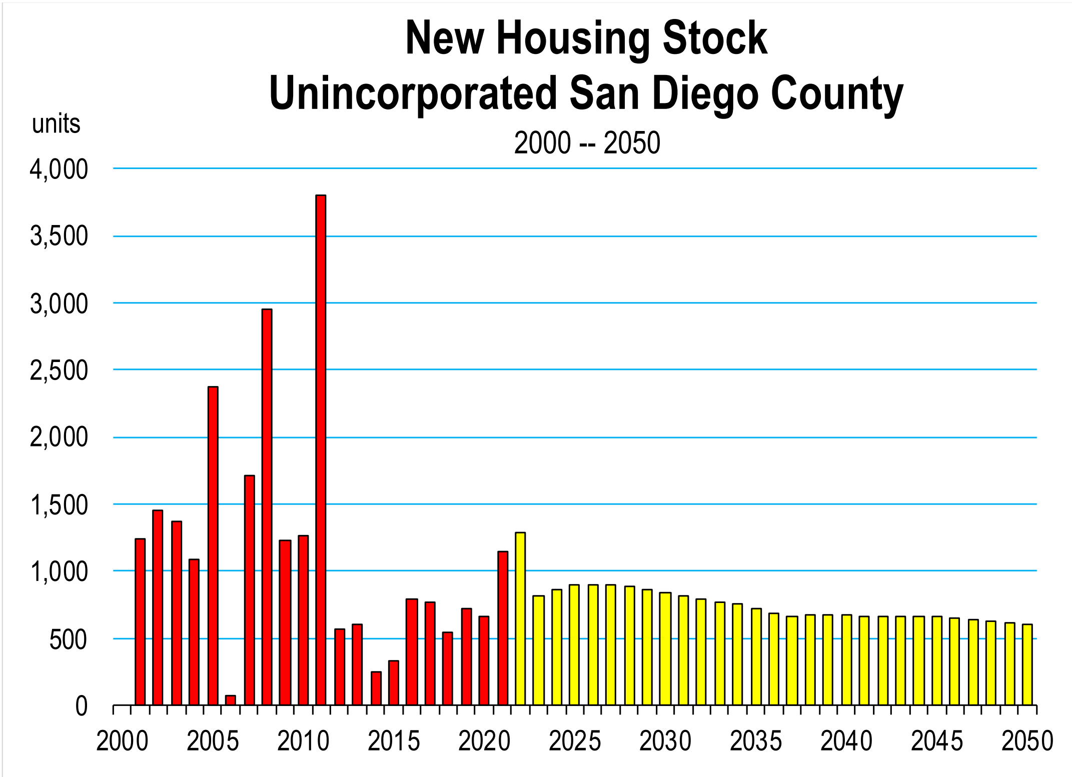


Figure 26: Ratio: Unincorporated Housing Stock to Total County Housing Stock

Dividing the unincorporated county population forecast by the unincorporated county housing stock forecast yields the following average household size, or population-per-unit ratio over time:

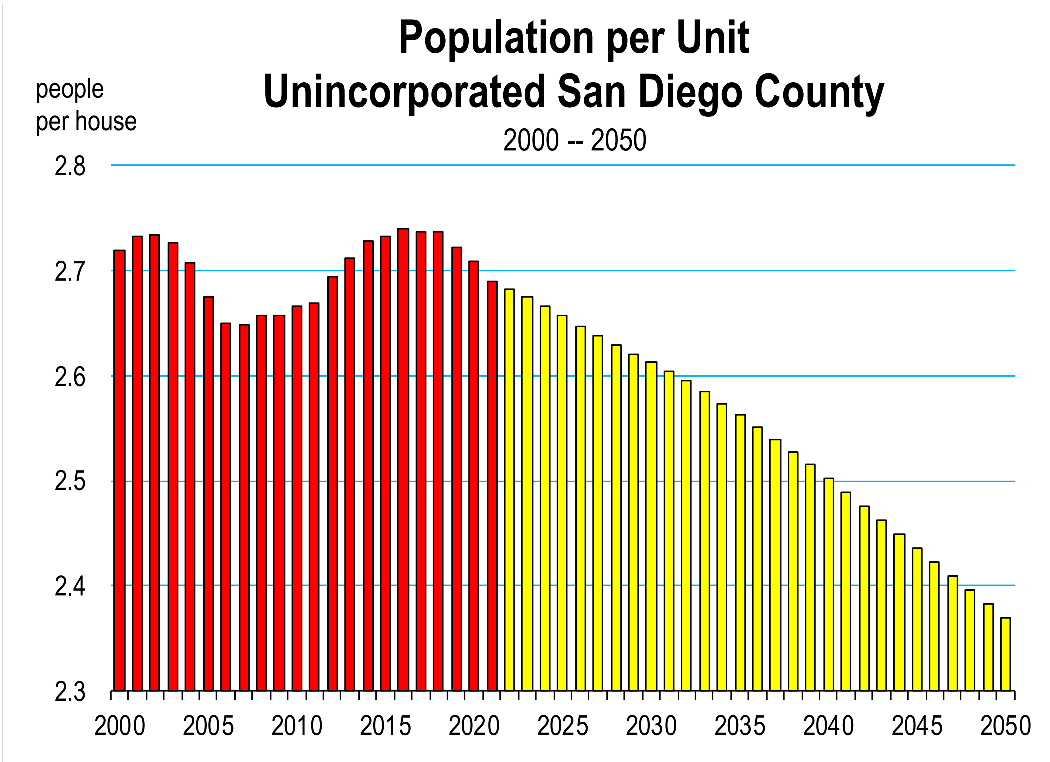


Figure 27: Ratio: Unincorporated Housing Stock to Total County Housing Stock

The decline in the ratio is consistent with the longer term county-wide trend, and what is being observed in other counties in recent years. As populations age, household sizes decline as children grow up and move away. Much fewer births since 2010 will necessarily lead to a much smaller fertile age cohort over the forecast (unless the trend in net migration dramatically reverses). Furthermore, because the birthrate is in decline, family sizes will be smaller.[24]

Our forecast of new housing units in the unincorporated area of San Diego County over the 2021 to 2050 period, along with the forecasts from the Report, are presented here:

Forecast of Housing Units built 2021-2050

	Report	California Economic Forecast
Base Growth Case	12,239	23,679
High Growth Case	23,431	not estimated

[24] See Appendix A

The housing unit forecast for the High Growth Case in the Report is nearly akin to the CEF forecast. Otherwise, the Base Growth Case is associated with more modest production of housing over the next 28 years.

Our independent forecast provides some corroborative evidence that the forecasts in the Report present a reasonable range of housing production for the unincorporated county area through 2050.

Employment

The approach adopted here to forecast employment in the unincorporated area is based on the premise that employment in the unincorporated area (as a share of total county employment) remains constant over time. The historical data tends to confirm this notion. Since 2010, the share of actual employment in the unincorporated area has been remarkably constant, averaging 7.17 percent of total county employment. See the **red trend** line below. The exception to the empirical observation of constancy occurs in 2020.

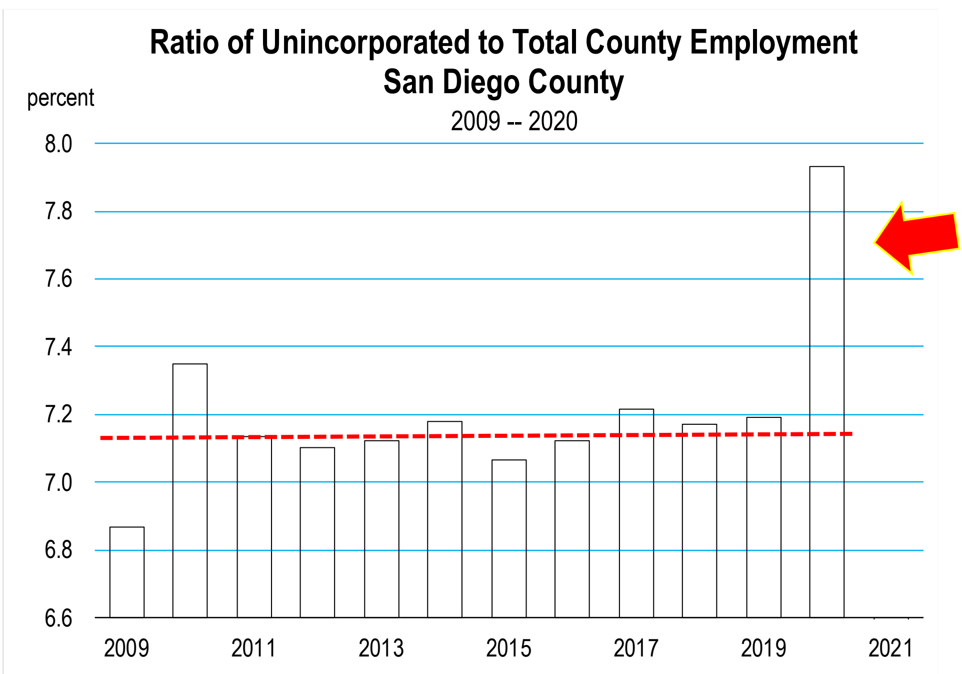


Figure 28: Ratio: Unincorporated Employment to Total County Employment

The 2020 estimate (**red arrow**) for employment is out of context from the rest of the historical data, due likely to this being the pandemic year when employment within the cities collapsed during the lockdowns. Consequently, we disregard this datapoint. The average share for the unincorporated area is stable enough from the previous history to assume a similar share of total county employment will be likely over the forecast.

A forecast was generated for the unincorporated area from knowledge of total county employment over the forecast. We update our forecasts of total San Diego County employment annually. The forecast is determined as a bottoms up approach where each industry is forecast and then summed to obtain total employment.[25]

The current employment forecast for San Diego County is presented in Figure 29.

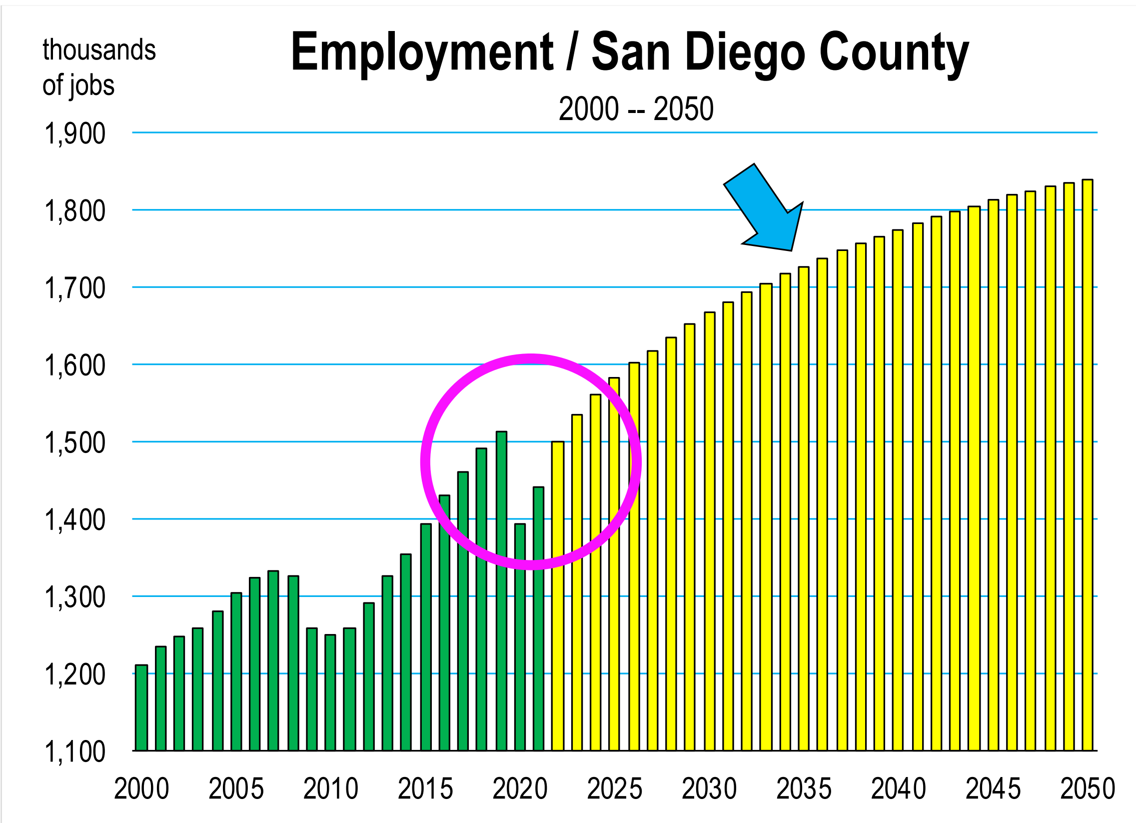


Figure 29: San Diego County Total Employment Forecast to 2050

Following the precipitous employment decline due to the pandemic **(purple circle)**, a recovery occurs and county employment fully recovers by 2023. The forecast has the

[25] Our industry classifications are two-digit NAICs sectors. Each employment sector is modeled using factors of the macro economy that would influence or cause variation in a particular industry's labor market over time A detailed explanation of the forecast methodology for county level employment can be found here: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/data-analytics-services/transportation-economics/socioeconomic-forecasts/2021/2021-pdf/methodology-update-2021-a11y.pdf

growth of new jobs diminishing over time **(as the blue arrow implies),** which is consistent with the diminishing population forecast growth over time (Figures 19 and 20).

Total employment does not decline at any point over the forecast as does population because jobs in the county are not exclusively tied to the resident population.

While there may be increased demand for workers by employers in San Diego County, the resident population will provide labor services *in addition to* commuters from Riverside County in the north (and in particular Temecula and Murrieta), and Mexico to the south.[26]

The resulting unincorporated county forecast is presented in Figure 30.

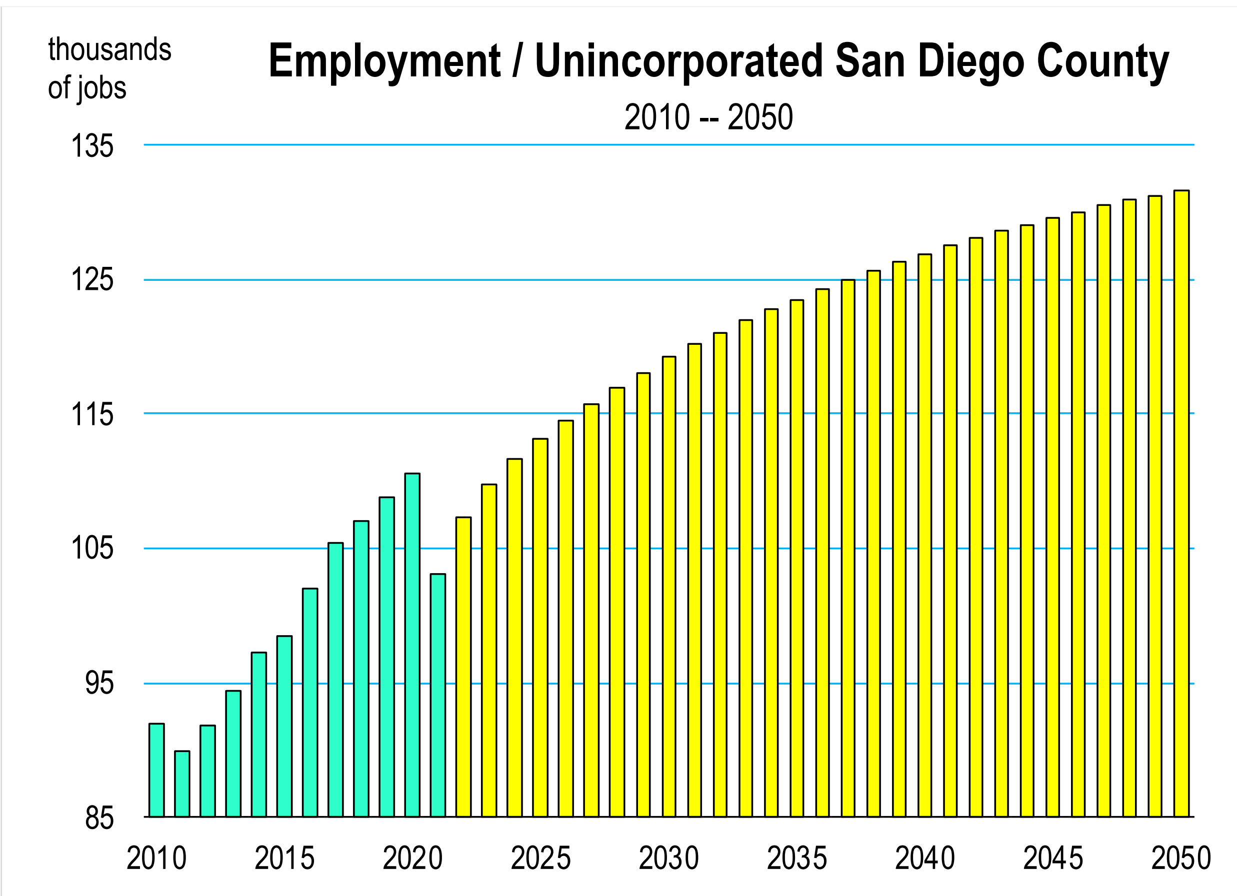


Figure 30: Unincorporated San Diego County Total Employment Forecast to 2050

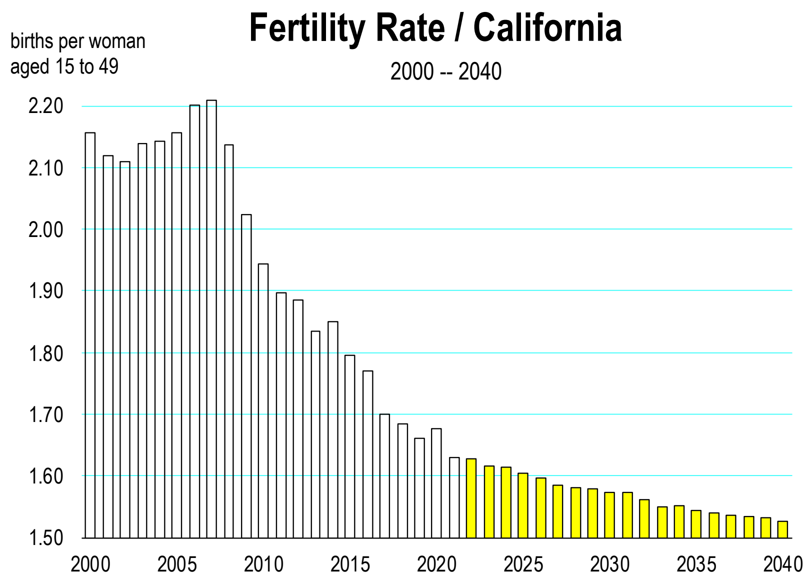
[26] In April 2022, the total number of people crossing the San Ysidro Port included 2.0 million passengers in autos, 620,000 pedestrians, and 16,500 bus passengers. Approximately the same number enter San Diego County from Mexico each month that return to Mexico.
https://explore.dot.gov/views/BorderCrossingData/Monthly?%3Aembed=y&%3AisGuestRedirectFromVizportal=y
From Riverside County, there is a net commute of 35,000 residents into San Diego County per day.
https://www.labormarketinfo.edd.ca.gov/file/commute-maps/sandiego2013.pdf

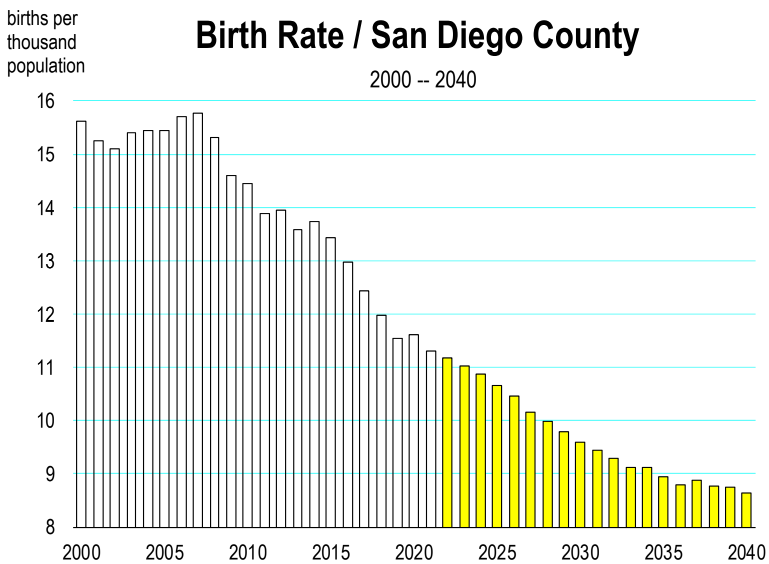
Between 2020 and 2050, employment rises from 110,636to 131,895, a gain in employment of just over 21,000 jobs. Our independent forecast of employment in the terminal year 2050 is nearly identical with the Housing Study forecast.

Total and Incremental Employment Forecasts
Unincorporated San Diego County

	Report	California Economic Forecast
Actual 2020	110,636	110,636
Base Growth Case 2050	131,801	131,895
Increment 2020-2050	21,165	21,259
High Growth Case 2050	136,803	not estimated
Increment 2020-2050	26,167	not estimated

Appendix A

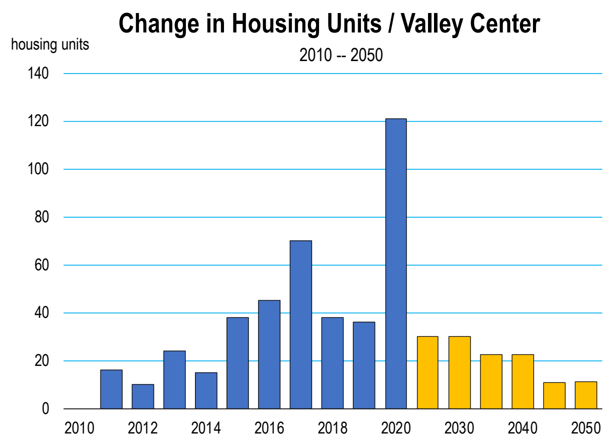


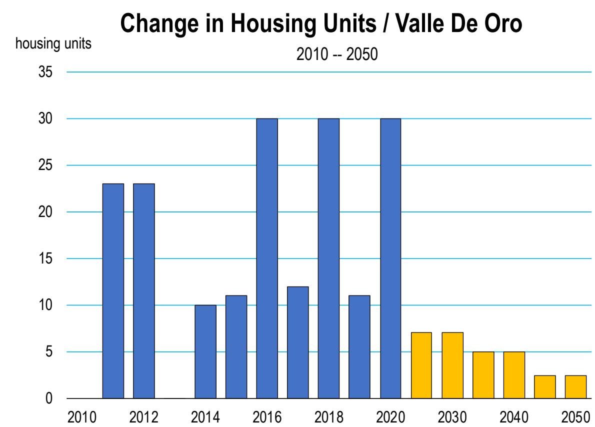


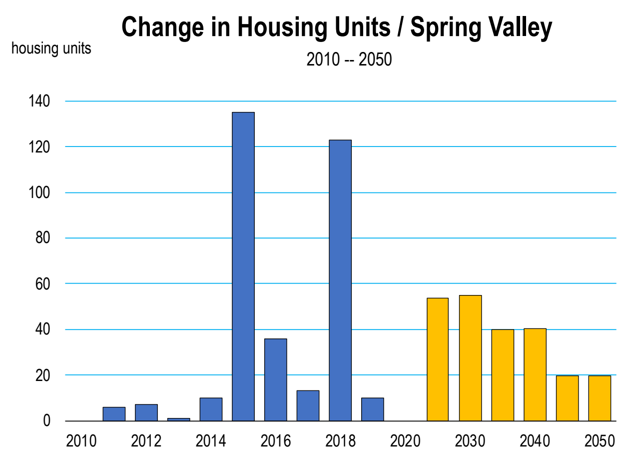
Report P-Births and Report P-2A, July 2021, Department of Finance
https://www.dof.ca.gov/forecasting/demographics/projections/
Source: Walter Schwarm, Chief Demographer, California Department of Finance, Recent Trends and Projections, 31st Annual Demographic Workshop, June 11, 2020, Figure 3.
https://scag.ca.gov/sites/main/files/file-attachments/walterschwarm.pdf?1604614050

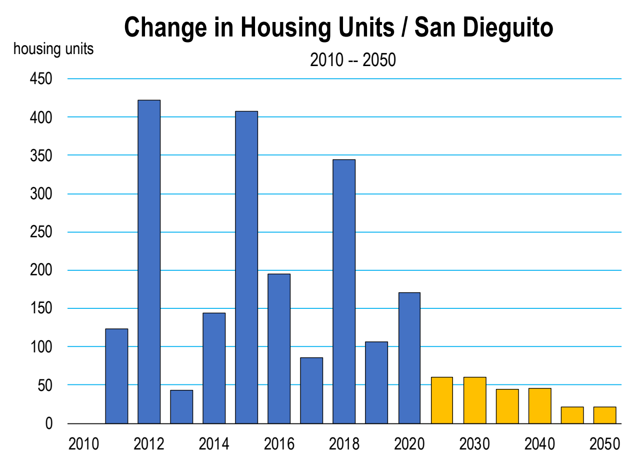
Appendix B

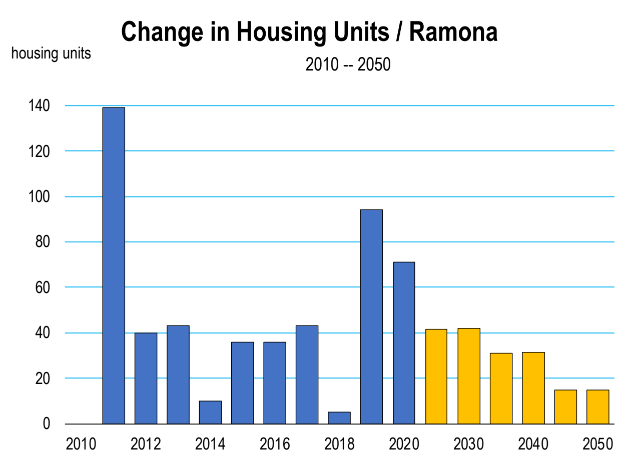
Annual housing unit forecasts (orange) for 10 largest CPAs

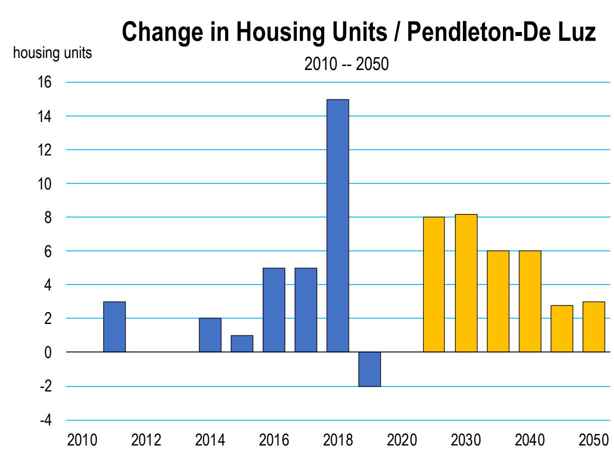


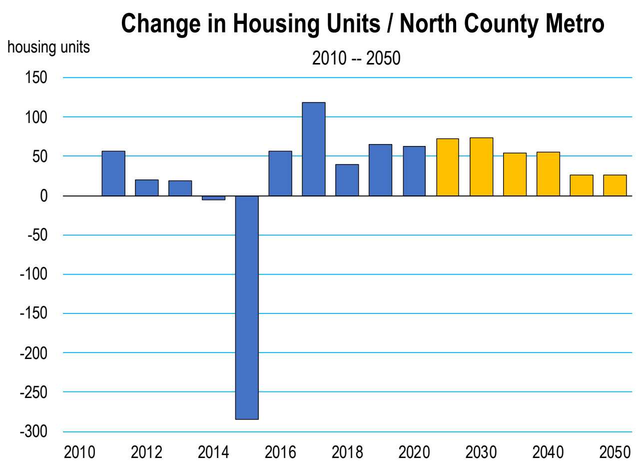


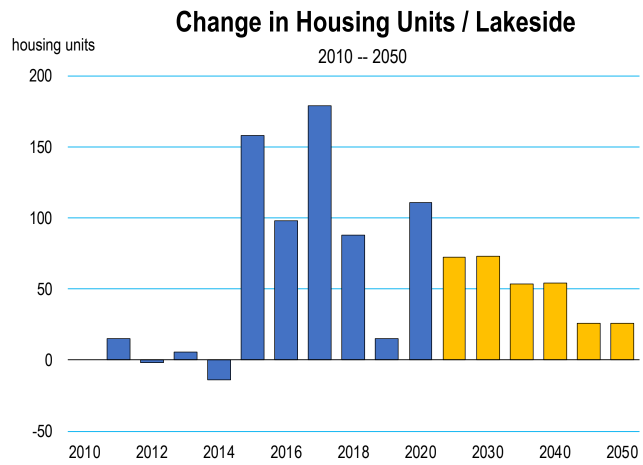


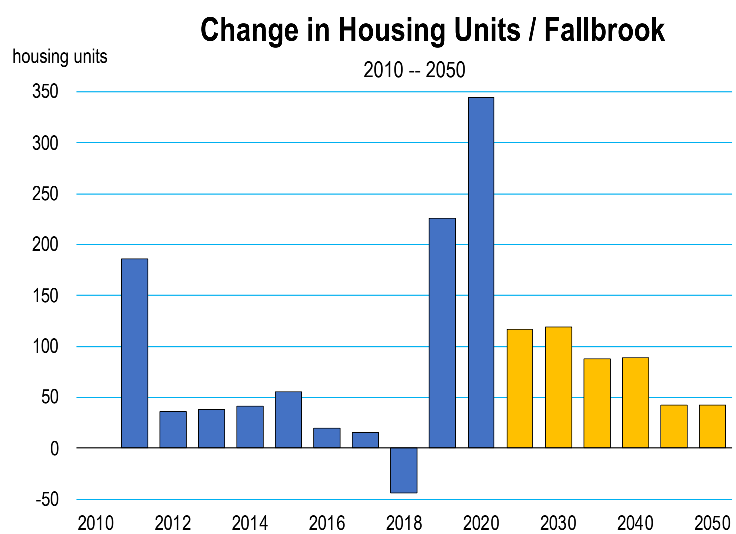


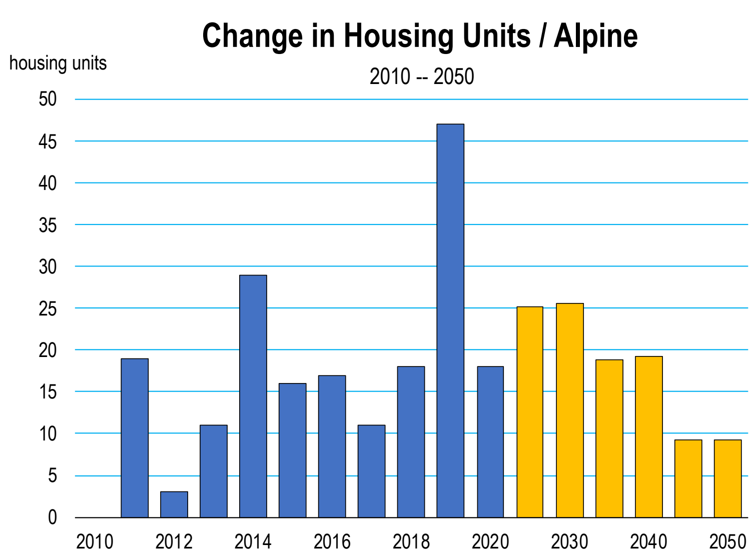





Change in Housing Units / North County Metro
2010 -- 2050
housing units
150
100
50
0
-50
-100
-150
-200
-250
-300
2010
2012
2014
2016
2018
2020
2030
2040
2050


Change in Housing Units / Lakeside
2010 -- 2050
housing units
200
150
100
50
0
-50
2010
2012
2014
2016
2018
2020
2030
2040
2050


Change in Housing Units / Fallbrook
2010 -- 2050
housing units
350
300
250
200
150
100
50
0
-50
2010
2012
2014
2016
2018
2020
2030
2040
2050


Change in Housing Units / Alpine
2010 -- 2050
housing units
50
45
40
35
30
25
20
15
10
5
0
2010
2012
2014
2016
2018
2020
2030
2040
2050

Appendix C

Dependent Variable:	**Population, unincorporated area**			
Method: Least Squares				
Date: 03/02/22 Time: 14:20				
Sample (adjusted): 1990 2021				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42690.39	9974.093	4.28	0.0002
POPJUL	0.14	0.003	41.53	0
DUM17ON	-9663.56	2488.737	-3.88	0.0005
R-squared	0.9877	Mean dependent var		463331.8
Adjusted R-squared	0.987	S.D. dependent var		36414.5
S.E. of regression	4178.043	Akaike info criterion		19.6
Sum squared resid	50.6E7	Schwarz criterion		19.7
Log likelihood	-310.634	F-statistic		1162.9
Durbin-Watson stat	0.984	Prob(F-statistic)		0

Dependent Variable:	**Housing Stock, unincorporated area**			
Method: Least Squares				
Date: 03/02/22 Time: 14:10				
Sample (adjusted): 2000 2020				
Included observations: 21 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	42434.27	4323.348	9.82	0
HS	0.11	0.004	27.10	0
DUM10ON	4024.09	428.069	9.40	0
R-squared	0.9953	Mean dependent var		166581.7
Adjusted R-squared	0.99	S.D. dependent var		7735.3
S.E. of regression	559.29	Akaike info criterion		15.6
Sum squared resid	56.3E6	Schwarz criterion		15.8
Log likelihood	-161.04	F-statistic		1903.8
Durbin-Watson stat	1.38	Prob(F-statistic)		0.0

Period of Analysis, review, and completion

A draft review was conducted between January 15 and February 19. The analysis incorporated data provided by AECOM, San Diego County PDS, the latest SANDAG population and employment forecast, our own comprehensive databank on San Diego County, and conversations with Meghan Kelly, Andrew Kaplan and Nathan Schmitt.

A final draft review and report was completed on July 21, 2022. The final review incorporated changes made by AECOM in response to the draft report, revised data for employment, and general revisions within their Report to (1) correct for typos and (2) provide further narrative to clarify methodology. This version dated August 15, 2022 (which corrects minor miscellaneous issues or typos) represents our Final Report.

The California Economic Forecast

The company incorporated in 2004 after becoming an independent consulting firm in 2000. The principal, Mark Schniepp, was the Director of the UCSB Economic Forecast Project from 1986 to 2000. Schniepp was also the senior economist for the State of California Controllers office from 1999 to 2003.

The California Economic Forecast has been monitoring, evaluating, and forecasting the regional economies of California since 2000. We have developed forecasting models for every county in the State of California. The forecasts include employment, population, net in-migration, personal income, consumer spending and the potential for new development. Mathematical models have been developed to forecast home sales and prices at the County and sub-county level.

We have particular expertise in housing markets, housing market fundamentals including housing supply and demand, and how those two forces have evolved by region in California over time. We annually produce projections of in-migration, housing sales, new housing development, and housing values for all California counties.

We have conducted numerous housing market studies and produced updated forecasts for real estate clients in California including the Construction Industry Research Board, The California Association of Realtors, Newhall Land, FivePoint Communities, The Irvine Company, and Associations of Realtors in Ventura, Santa Barbara, and Los Angeles Counties.

We have specialized in monitoring the new development process in California, and we have tracked all principal new development in the state for the last 6 years which has provided us an intrinsic understanding of the entitlement process and where the growth of housing and commercial development is occurring throughout the state.

The company participates in annual economic forecast conferences in the Santa Clarita Valley, Orange County, Ventura County and Santa Barbara County. At times, much of the content features both the new residential development sector and the existing housing sector for the local region. The conferences are often sponsored by the local Associations of Realtors®.[27]

The forecasting models have undergone significant revision and update over time. This includes the regional forecasting model for all Southern California Counties, including San Diego County.

The forecasts have been used extensively by Cal Trans and Kaiser Permanente every year over the last 15 years. The model has also been used to produce a published forecast for the UCLA Anderson Forecast publication and presentation for the San Diego County economy. Forecast conferences with UCLA have been conducted at UC San Diego.

[27] Santa Barbara Association of Realtors, Conejo-Simi Valley-Moorpark Association of Realtors, Ventura County Coastal Association of Realtors, Southland Regional Association of Realtors.

Appendix C

CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis

FEHR & PEERS

Memorandum

Date: April 10, 2023

To: Andrew Martin, Ascent

From: Katy Cole and Andrew Scher, Fehr & Peers

Subject: CAP VMT Modeling Assumptions: Use of SANDAG Series 14.3.0 Model Year 2016 for County Baseline VMT Analysis

SD21-0394

This memorandum provides documentation of assumptions for modeling vehicle miles traveled (VMT) for the update to the County's Climate Action Plan (CAP). Specifically, the memorandum summarizes Fehr & Peers' comparison of SANDAG ABM 2+ Model assumptions for dwelling units and households in the unincorporated county to dwelling unit data the County has recorded in its Housing Production and Capacity Portal, referred to as the "housing portal." The purpose of this comparison is to identify whether modeled results for the number and distribution of dwelling units in the unincorporated county in Year 2016 from SANDAG's ABM 2+ Model appropriately reflect the number and distribution of dwelling unit data the County has recorded for the unincorporated area in its housing portal for 2020. This comparison was requested by the County to help inform whether the SANDAG ABM 2+ Model 2016 VMT outputs appropriately represent 2019 unincorporated county VMT as part of the County's CAP Update.

Comparison of County Housing Portal to SANDAG ABM 2+ Model

Methodology

The County provided Fehr & Peers with dwelling unit data for the unincorporated county from their housing portal. Using the County's housing portal data, Fehr & Peers estimated 2020 dwelling unit totals for each community plan area (CPA) in the unincorporated county by taking the sum of the 2012 dwelling unit totals, units built between January 2012 and January 2021 (excluding units on lands outside of County jurisdiction), and units that are part of projects with in-process grading permits as of January 2021 (excluding units on lands outside of County jurisdiction). The estimated 2020 dwelling unit total for the unincorporated area from the

County's housing portal was then compared to the total dwelling units for the unincorporated area assumed in the 2016 baseline year of the SANDAG ABM 2+ Model (Series 14.3.0).

Results of the Comparison

Table 1 shows the how the number of dwelling units in the model for 2016 compared to the number of dwelling units from the County housing portal for 2020. There is less than one percent difference between the total dwelling units in the Model and the total dwelling units recorded in the County's housing portal. This indicates that both the model and County housing portal accurately reflect 2020 dwelling units, and the baseline model assumptions are built upon a solid data foundation. This also indicates that little growth occurred in the unincorporated county between 2019 and 2020, so the 2016 model also reflects conditions in 2019 for the unincorporated county.

Table 1: Model Units/Households and County Housing Portal Units Comparison

Comparison	Model	Portal	Difference	% Difference
2016 Model Dwelling Units vs. 2020 Portal Dwelling Units	178,991	179,235	244	<1%

Attachment A shows how the number of dwelling units in the 2016 model compares to the number of dwelling units from the County housing portal for 2020 for each community plan area (CPA).

Some larger differences between the model and housing portal for some CPAs may be a result of TAZs not following CPA boundaries. Unit totals for a TAZ were assigned to the CPA within which the majority of the TAZ lies. Overestimates and underestimates by CPA in the model will not significantly change VMT results given that VMT will be calculated for CAP work at the countywide level rather than the CPA level.

Conclusion

Based on our comparison of the ABM 2+ 2016 dwelling unit assumptions to the 2020 County housing portal data, the differences between the model data and County data are acceptable for the purposes of countywide VMT and GHG modeling. Therefore, the SANDAG ABM 2+ Model (Series 14.3.0) year 2016 is an appropriate tool to use to estimate VMT for the unincorporated county for 2019 conditions. The VMT estimates will support development of the baseline GHG inventory for the updated County CAP.

Attachment A: Model Units and County Units Comparison

CPA	Comparison between 2012 Model Units and 2012 Portal Units				Comparison between 2020 Model Units and 2020 Portal Units (2012 Units Plus Units Built Since or Under Construction)				Comparison between 2020 Model Households and 2020 Portal Units			
	2012 Model Units	2012 Portal Units	Diff	% Diff	2020 Model Units	2020 Portal Units	Diff	% Diff	2020 Model Households	2020 Portal Units	Diff	% Diff
Alpine	6508	6554	-46	-1%	7308	6800	508	7%	6464	6800	-336	-5%
Barona	202	202	0	0%	202	202	0	0%	202	202	0	0%
Bonsall	3688	3905	-217	-6%	4150	4136	14	0%	3974	4136	-162	-4%
Borrego Springs	2496	2596	-100	-4%	2702	2616	86	3%	1748	2616	-868	-50%
Boulevard	827	834	-7	-1%	868	855	13	1%	740	855	-115	-16%
Central Mountain	3	6	-3	-100%	9	6	3	33%	7	6	1	14%
County Islands	855	596	259	30%	926	614	312	34%	871	614	257	30%
Crest - Dehesa	3568	3585	-17	0%	3806	3691	115	3%	3711	3691	20	1%
Cuyamaca	250	228	22	9%	282	247	35	12%	236	247	-11	-5%
Descanso	630	714	-84	-13%	646	740	-94	-15%	630	740	-110	-17%
Desert	1154	969	185	16%	1024	994	30	3%	557	994	-437	-78%
Fallbrook	15887	16151	-264	-2%	17402	17454	-52	0%	16554	17454	-900	-5%
Hidden Meadows	3506	3180	326	9%	3507	3296	211	6%	3008	3296	-288	-10%
Jacumba	409	404	5	1%	372	409	-37	-10%	320	409	-89	-28%
Jamul	3293	3305	-12	0%	4035	3429	606	15%	3937	3429	508	13%
Julian	1696	1722	-26	-2%	1935	1778	157	8%	1543	1778	-235	-15%
Lake Morena / Campo	1224	1321	-97	-8%	1319	1367	-48	-4%	1310	1367	-57	-4%
Lakeside	27473	27587	-114	0%	29517	28455	1062	4%	28264	28455	-191	-1%
Mountain Empire	121	49	72	60%	152	49	103	68%	134	49	85	63%
North County Metro	11653	11583	70	1%	12583	12071	512	4%	12148	12071	77	1%
North Mountain	1063	1247	-184	-17%	1163	1272	-109	-9%	1036	1272	-236	-23%
Otay	8	7	1	13%	9	7	2	22%	9	7	2	22%
Pala - Pauma	2039	1986	53	3%	2366	2020	346	15%	2243	2020	223	10%
Palomar Mountain	492	290	202	41%	466	301	165	35%	341	301	40	12%
Pendleton - De Luz	7770	7534	236	3%	9418	7549	1869	20%	8088	7549	539	7%
Pine Valley	1249	1251	-2	0%	1391	1270	121	9%	1221	1270	-49	-4%
Potrero	364	375	-11	-3%	416	378	38	9%	417	378	39	9%
Rainbow	707	716	-9	-1%	845	738	107	13%	844	738	106	13%
Ramona	12499	12555	-56	0%	13361	13044	317	2%	13006	13044	-38	0%
San Dieguito	11927	11870	57	0%	13045	13625	-580	-4%	12139	13625	-1486	-12%
Spring Valley	20402	20546	-144	-1%	21374	20956	418	2%	19952	20956	-1004	-5%
Sweetwater	4683	4718	-35	-1%	4832	4786	46	1%	4621	4786	-165	-4%
Tecate	45	55	-10	-22%	44	55	-11	-25%	43	55	-12	-28%
Twin Oaks	1204	969	235	20%	1336	1011	325	24%	1316	1011	305	23%
Valle De Oro	15497	15581	-84	-1%	15483	15711	-228	-1%	15015	15711	-696	-5%
Valley Center	6621	6664	-43	-1%	8002	7303	699	9%	7871	7303	568	7%
Total	**172013**	**171855**	**158**	**0%**	**186296**	**179235**	**7061**	**4%**	**174520**	**179235**	**-4715**	**-3%**

DRAFT - October 2023

Appendix 04

County of San Diego Local Government Operations Greenhouse Gas 2019 Inventory and Projections

Technical Report
for the

County of San Diego Local Government Operations Greenhouse Gas 2019 Inventory and Projections

Prepared By:

Ascent

1230 Columbia Street, Suite 440
San Diego, CA 92101

Prepared For:

County of San Diego

Planning & Development Services
5510 Overland Avenue, Suite 310
San Diego, CA 92113

October 2023

TABLE OF CONTENTS

Figures

Tables

ACRONYMS AND ABBREVIATIONS

ACIP	Airport Capital Improvement Plan
ADC	alternative daily cover
AB	Assembly Bill
CARB	California Air Resources Board
CCAR	California Climate Action Registry
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CAP	Climate Action Plan
IPCC	Climate Change
CRIS	Climate Registry Information System
eGRID	Emissions & Generation Resource Integrated Database
EU ETS	European Union Emission Trading System
Gal	gallon
GRP	General Reporting Protocol
GWh	gigawatt-hours
GWP	global warming potential
G	grams
GHG	greenhouse gas
GSE	ground support equipment
Kg	kilograms
kWh	kilowatt-hours
LFG	landfill gas
LGT	Landfill Gas Tool
LGOP	Local Government Operations
ICLEI	Local Governments for Sustainability
CH_4	methane
$MTCO_2e$	metric tons of CO_2e
MMBTU	million British Thermal Units
N_2O	nitrous oxide
SB	Senate Bill
TCR	The Climate Registry
WBCSD	World Business Council for Sustainable Development
UNFCCC	United Nations Framework Convention on Climate Change

USEPA	United States Environmental Protection Agency
WECC	Western Electricity Coordinating Council
WRI	World Resources Institute
VMT	vehicle miles traveled

1 INTRODUCTION

As a supplement to the *Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections for the County of San Diego's Climate Action Plan (CAP)*, this document presents the greenhouse gas (GHG) emissions related to County of San Diego (County) operations in 2019. County operations refer to all facilities and operations owned and operated by the County. The purpose of the GHG emissions inventory is to identify source types, distribution, and overall magnitude of GHG emissions. Emissions projections for 2030 through 2050 are also provided.

The County is a member of The Climate Registry (TCR) and has reported its County operational emissions to the TCR since 2010. The inventory reported in this document has primarily been compiled from information in the Climate Registry Information System (CRIS) database, TCR's GHG emissions reporting platform, and supplemented by additional emissions quantification as detailed in the following sections. The community-wide inventory includes the emissions presented in the County operations inventory, with some sectors overlapping. For example, the portion of employee commute-related emissions that occur, at least in part, in the unincorporated county are already included in the overall on-road transportation estimates in the community-wide inventory. However, commute trips that might occur entirely outside of the unincorporated county are unique to County operations and are added into the community-wide inventory separately. Additionally, some County facilities and operations are located within incorporated cities; nonetheless, the emissions from these facilities are being accounted for within this inventory as these facilities are owned and/or operated by the County.

Refer to the Unincorporated County of *San Diego 2019 Greenhouse Gas Emissions Inventory and Projections for the County of San Diego's Climate Action Plan (CAP)* for a discussion of how County operations are included in the community-wide inventory.

2 GHG INVENTORY METHODOLOGY

The purpose of the GHG emissions inventory is to identify source types, distribution, and overall magnitude of GHG emissions resulting from operations of the County government. The County operations GHG inventory was developed using TCR's General Reporting Protocol (GRP) (Version 3). The GRP requires general purpose local governments reporting to The Climate Registry to report in conformance with the Local Government Operations Protocol (LGOP). The LGOP was developed by the California Air Resources Board (CARB), the California Climate Action Registry (CCAR), and Local Governments for Sustainability (ICLEI), in collaboration with TCR. The LGOP is designed to provide a standardized set of guidelines to assist local governments with quantifying and reporting GHG emissions associated with their operations. The County operations GHG inventory was developed for the year 2019 (baseline year) using latest version (Version 1.1) of the LGOP (TCR 2010). The methodology used to develop and compile the inventory is described in the following sections.

2.1 OVERVIEW

An emissions "sector" is a distinct subset of a market, society, industry, or economy, whose components share similar characteristics. The County's operations GHG inventory was compiled for the following emissions sectors, as per the LGOP:

- Airports
- Buildings & Other Facilities
- Employee Commute
- Landfills
- Public Lighting
- Solid Waste
- Vehicle Fleet
- Wastewater Facilities
- Water Pumping
- Water Use

This inventory focuses on the three GHGs most relevant to local government policymaking: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These gases comprise a large majority of GHG emissions from the County's government operations. The LGOP and most other GHG reporting protocols also include consideration of three additional GHGs: hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The County's reported inventory in CRIS includes R-401A, R-404A, R-410A, and R-438A which are fugitive HFC emissions from refrigerant use in County facilities, where data were available. Emissions of PFCs (byproducts of aluminum and semiconductor manufacturing) and SF6 (used electrical transmission and distribution equipment, electronic and semiconductor manufacturing, and magnesium production) as well as HFCs from sources other than refrigerants (e.g., insulating foams, aerosol propellants), are not included in the County's inventory because data needed to quantify these gases are prohibitively difficult to obtain and the primary sources of these emissions are not within the scope of County operations.

All emissions are converted to carbon dioxide equivalent (CO_2e) so that GHGs can be compared using a common metric. Non-CO_2 gases are converted to CO_2e using internationally recognized 100-year global warming potential (GWP) factors. GWPs are developed by the Intergovernmental Panel on Climate Change (IPCC) to represent the heat-trapping ability of each GHG relative to that of CO_2. For example, the GWP of CH_4 is 25 because one metric ton of CH_4 has 25 times more capacity to trap heat in the atmosphere than one metric ton of CO_2. The County's CRIS database inventory used GWPs from IPCC's Fifth Assessment Report. The inventory presented in this document uses GWPs from the Fourth Assessment Report to be consistent with the approach used by the California Air Resources Board (CARB) in the 2000–2020 statewide GHG inventory and Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections. The GWPs factors used in this report are shown in Table 1.

Table 1 Global Warming Potentials used in Baseline Inventory and Projections

Greenhouse Gas	Global Warming Potential (GWP)
Carbon dioxide (CO_2) [1]	1
Methane (CH_4) [1]	25
Nitrous oxide (N_2O) [1]	298
R-404A[2]	3,922
R-401A	1182
R-438A	2265
R-410A	2088

Source: [1]IPCC 2007, [2]CARB 2023.

2.2 BASE YEAR

The LGOP recommends that a local government's emissions inventory include all GHG emissions occurring during a selected calendar year. Reporting GHG inventories on a calendar year basis is considered an international standard. The United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol, The European Union Emission Trading System (EU ETS), TCR, and the State of California's mandatory reporting regulation under Assembly Bill (AB) 32, all require GHG inventories to be tracked and reported on a calendar year basis. The County's inventory was prepared and compiled for the year 2019, to be consistent with the communitywide GHG inventory developed for the CAP.

2.3 OPERATIONAL CONTROL APPROACH

The County's local government operations inventory was prepared using the operational control approach. The LGOP strongly encourages local governments to utilize the operational control approach to define their organizational boundary because this control approach most accurately represents the emission sources that local governments can directly influence. The organizational boundary of a GHG inventory is the boundary that defines which emission sources are included and which are excluded from the inventory.

Under the operational control approach, a local government accounts for 100 percent of the GHG emissions from operations over which it has operational control, including both wholly owned and partially owned facilities. A local government has operational control over a facility or operation if it has the full authority to introduce and implement its operating policies (for example, it holds an operating lease for the facility, or has the ability to implement health and safety policies). Operational control is the consolidation approach required under AB 32's mandatory reporting program and is consistent with the requirements of many other types of environmental and air quality reporting (for example, Clean Air Act Title V reporting).

The LGOP also references a financial control approach for defining a local government's organizational boundary. Under the financial control approach, the economic relationship between the local government and the operation takes precedence over the legal ownership (for example, the local government may have financial control over the operation even if it has less than 50 percent interest in that operation). Therefore, an inventory prepared under the financial control approach may include emissions that the local government cannot directly influence. The financial approach was not used in this inventory.

2.4 GHG EMISSION SCOPES

To separately account for direct and indirect emissions, to increase transparency, and to provide usefulness for different types of climate policies and goals, the LGOP follows the World Resources Institute and the World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol Corporate Standard in categorizing direct and indirect emissions into "scopes" as follows, assuming the use of the operational control approach to the organizational boundary:

Scope 1: All direct GHG emissions (with the exception of direct CO_2 emissions from biogenic sources) from sources controlled by the reporting entity.

Scope 2: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling, at facilities controlled by the reporting entity.

Scope 3: All other indirect emissions not covered in Scope 2, such as emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity (e.g., employee commuting and business travel), outsourced activities, waste disposal, etc.

GHG accounting programs recognize that the Scope 2 emissions reported by one entity may also be reported as Scope 1 emissions by another entity. For example, the Scope 2 emissions from electricity use reported by a local government may also be reported as Scope 1 emissions by the regionally serving utility that produced the electricity. This dual reporting does not constitute double counting of emissions as the entities report the emissions associated with the electricity production and use in different scopes (Scope 1 for the regionally serving utility and Scope 2 for the local government). Emissions can only be aggregated meaningfully within a scope, not across scopes. By definition, Scope 2 emissions will always be accounted for by another entity as Scope 1 emissions. Therefore, Scope 1 and 2 emissions must be accounted for separately. The appropriate scopes for each inventory sector for the County are identified in Section 3.

This also applies to Scope 3 emissions, as one entity's Scope 3 emissions are also another entity's Scope 1 or 2 emissions. Thus, all scopes should be accounted for separately. Reporting both Scope 1 and Scope 2 emissions helps ensure that local governments create a comprehensive emissions profile that reflects the decisions and activities of their operations. Reporting of Scope 3 emissions is encouraged but considered optional by the WRI/WBCSD and the LGOP. A large majority of Scope 3 emissions are typically associated with life-cycle processes, which can be speculative and difficult to quantify. The County's inventory includes Scope 3 emissions for sectors where data were readily available, including government-generated solid waste, and employee commute.

3 GHG INVENTORY RESULTS

In 2019, the total GHG emissions from County operations were estimated at 130,591 metric tons of CO_2e ($MTCO_2$e), distributed into 9 sectors as shown in Table 2 and Figure 1. The inventory accounts for GHG emissions from County operations, including County operations that occur in incorporated cities, because these emissions are caused by County operations. The GHG inventory was primarily generated from information in the CRIS database. Emissions sectors extracted from the CRIS database include electricity consumption, natural gas consumption and other fuel consumption at County-owned and operated buildings, airports, and public facilities; public and street lighting; landfills; fuel consumption in County fleet; water use in buildings and facilities; wastewater treatment facilities; and water pumps. The CRIS inventory was supplemented with estimated emissions from employee commute and employee-generated solid waste.

Methods used to develop the inventory are described in the following sections. Emissions associated with electricity consumption are classified as Scope 2 emissions while emissions associated with employee commute and employee-generated solid waste are Scope 3 emissions. All other reported emissions represent Scope 1 emissions. As stated in Section 2.1, all GHGs were converted to carbon dioxide equivalents using GWP factors from IPCC's Fourth Assessment Report.

Table 2 2019 Greenhouse Gas Inventory for County of San Diego Operations

Serial Number	Source[1]	Emissions (MT)							
		CO_2	CH_4	N_2O	R-401A	R-404A	R-410A	R-438A	CO_2e
1	Airports[2]								
a.	Electricity Use[3]	200	0.01	0.00	-	-	-	-	200
b.	Natural Gas	24	0.00	0.00	-	-	-	-	24
c.	Diesel Fuel[4]	0.96	0.00	0.00	-	-	-	-	0.96
d.	Propane[4]	0.22	0.00	0.00	-	-	-	-	0.22
	Subtotal[5]	**224**	**0**	**0**	**-**	**-**	**-**	**-**	**225**
2	Buildings & Other Facilities								
a.	Electricity Use[3]	23,926	1.64	0.19	-			-	24,025
b.	Natural Gas	13,563	1.20	0.03	-			-	13,601
c.	Refrigerants	-	-	-	0.00	0.08	0.04	0.03	462
d.	Diesel Fuel[6]	95	0.01	0.00	-	-	-	-	95
e.	Propane	27	0.00	0.00	-	-	-	-	27
	Subtotal[5]	*37,611*	*2.86*	*0.22*	*0.00*	*0.08*	*0.04*	*0.03*	*38,210*
3	Employee Commute								
a.	Vehicle Fuel Use	-	-	-	-	-	-	-	38,803
4	Vehicle Fleet								
a.	Fuel: Electricity	12	0.00	0.00	-	-	-	-	12
b.	Fuel: Gasoline	21,843	0.58	0.66	-	-	-	-	22,055
c.	Fuel: Diesel	38	0.06	0.07	-	-	-	-	61
d.	Fuel: Renewable Diesel	4,484	-	-	-	-	-	-	4,484
	Subtotal[5]	**26,376**	**0.64**	**0.74**	**-**	**-**	**-**	**-**	**26,612**

5	**Landfills**[7]								
a.	Fugitive Emissions (including Viejas Landfill)[8]	-	957	-	-	-	-	-	23,918
b.	Pilot Light	2			-	-	-	-	2
c.	Purchased Electricity[3]	80	0.01	0.00	-	-	-	-	81
d.	Natural Gas	86	0.01	0.00	-	-	-	-	87
e.	Flared Gas	-	0.62	0.12	-	-	-	-	52
	Subtotal[5]	**168**	**957.35**	**0.12**	**-**	**-**	**-**	**-**	**24,139**
6	**Public Lighting**								
a.	Purchased Electricity[3]	1,258	0.09	0.01	-	-	-	-	1,263
7	**Wastewater Facilities**								
a.	Electricity Use[3]	27	0.00	0.00	-	-	-	-	27
b.	Process Emissions[9]	-	-	0.01	-	-	-	-	3
	Subtotal[5]	***27***	***0.00***	***0.01***	**-**	**-**	**-**	**-**	***30***
8	**Water**								
a.	Water Pumps	129	0.01	0.00	-	-	-	-	130
b.	Water Use at Facilities[10]	34	-	-	-	-	-	-	34
	Subtotal[5]	**163**	**0.01**	**0.00**	**-**	**-**	**-**	**-**	**163**
9	**Solid Waste**								
a.	Employee-Generated Solid Waste	-	113	-	-	-	-	-	2,812
	TOTAL	**65,827**	**1,073**	**1**	**0.00**	**0.08**	**0.04**	**0.03**	**132,257**

Notes:
"-" = no emissions; CH_4=methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalents; MT = metric tons; N_2O=nitrous oxide; R-401A= Freon MP39 (R-401A) refrigerant; R-404A = Freon 404A (R-404A) refrigerant; R-410A = Freon 410A (R-410A) refrigerant; R-438A = Freon M099 (R-438A) refrigerant.

[1] All emissions data available from the Climate Registry Information System (CRIS) unless otherwise noted.

[2] Airports emissions exclude emissions generated by fuel consumption from aircraft not owned or operated by the County. This is consistent with LGOP's operational control approach (see Section 2.3 for details).

[3] Purchased electricity emissions estimated using emission factors from CRIS inventory.

[4] Data for diesel and propane use in Airport Ground Support Equipment was provided separately by the County.

[5] Values may not equal totals due to rounding.

[6] Diesel used in emergency generators only.

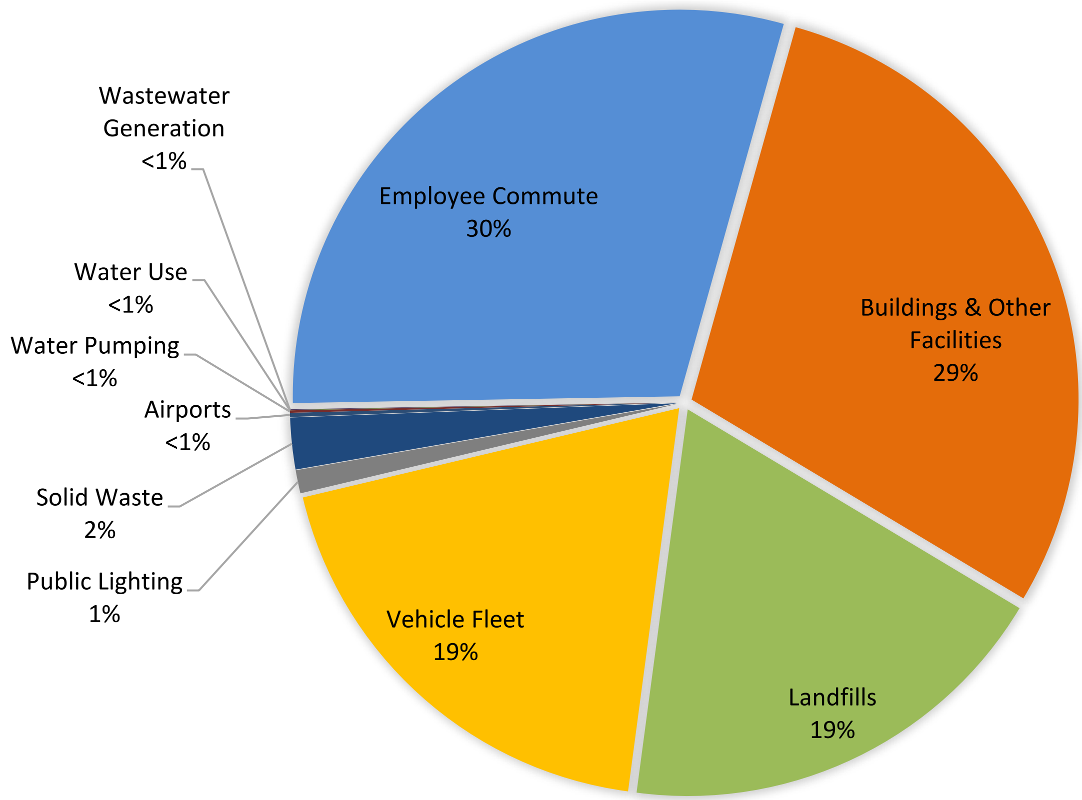
[7] Landfill emissions exclude CO_2 emissions from flaring of landfill gases because this carbon would have normally been released as biogenic CO_2 from natural decomposition completing the photosynthesis/respiration cycle (USEPA, 2010). These emissions are not included in the inventory.

[8] Emissions from Viejas Landfill were not included in the CRIS local government inventory. Emissions from Viejas Landfill were calculated separately.

[9] All wastewater treatment facilities owned and operated by the County have aerobic operations and, thus, do not emit measurable CH_4 emissions according to Box 10.2 of the Local Government Operations Protocol (CARB 2010). These include emissions from wastewater facilities within the unincorporated county and owned and operated by the County plus wastewater generated by County facilities located outside of the unincorporated county.

[10] Emissions from water used at County facilities are from energy used to supply and convey, treat, and distribute water. The emission factors used for estimating water emissions are the same as the purchased electricity emission factors used in the CRIS inventory.

Source: County of San Diego 2019 Greenhouse Gas Inventory as reported in the CRIS database; data compiled by Ascent in 2023.



Note: Due to rounding, the percentages do not add, or percentages exceed 100 percent

Figure 1 2019 Greenhouse Gas Inventory for County of San Diego Local Government Operations

3.1 RELATIONSHIP TO THE UNINCORPORATED SAN DIEGO COUNTY 2019 GREENHOUSE GAS EMISSIONS INVENTORY AND PROJECTIONS

GHG emissions from County operations overlap with the community-wide inventory and projections. All emissions physically occurring within the unincorporated county are assumed to be included in the community-wide inventory as the methodology is based on physical boundaries rather than consumers. In addition, vehicles trips occurring in part or in whole within the unincorporated county are also included in the community-wide inventory. Table 3 shows additional detail on which County operation emissions are already included within the community-wide inventory for activities within the unincorporated area.

Table 3 County of San Diego Operation Emissions included in the Unincorporated Area Inventory

County Operations Sector	Portion of County Operations Emissions included in the Unincorporated Area Inventory	Reason
Airports	Part	All County airports except McClellan-Palomar and Gillespie Field are located in the unincorporated county.
Buildings & Other Facilities	Part	Only County government buildings and facilities located within the unincorporated county are included.
Employee Commute	Part	Only County employee commute trips that end and/or begin in the unincorporated county are included.
Landfills	Part	Four out of the 11 closed landfills operated by the County are located in the unincorporated county.
Public Lighting (Streetlights and Traffic Signals)	All	All County streetlights and traffic signals are located in the unincorporated county.
Solid Waste	None	A vast majority of County government buildings and facilities generating solid waste are located outside the unincorporated county (e.g., main offices)
Vehicle Fleet	All	Assumes vast majority of County government vehicle fleet operations occur in part or fully within the unincorporated county.
Wastewater Facilities	All	All County wastewater facilities are located in the unincorporated county.
Water Pumping	All	All County water pumping facilities are located in the unincorporated county.
Water Use	Part	Some County facilities using water are located in the unincorporated county.

Source: Ascent in 2023.

4 INVENTORY METHODS

The following sections outline the methodologies used in estimating GHG emissions for each source or fuel type applicable to the County's operational inventory.

4.1 ELECTRICITY

Electricity consumption data for County facilities and operations in 2019 were available from electricity purchase records input into the CRIS database. The CRIS database includes total annual kilowatt-hours (kWh) for each facility, which was used to estimate associated GHG emissions, as shown in Table 4. In 2019, County facilities used 113 gigawatt-hours (GWh) of electricity. To calculate GHG emissions associated with electricity generation, the United States Environmental Protection Agency's (USEPA's) 2010 Emissions & Generation Resource Integrated Database (eGRID) electricity emission factors for CO_2, CH_4, and N_2O for the Western Electricity Coordinating Council (WECC) region (which includes California) were applied to consumption data. These emission factors are as follows: 496.5 pounds CO_2 per megawatt-hours (lb CO_2/MWh), 34 lb CH_4/gigawatt-hours (GWh), and 4 lb N_2O/GWh (TCR 2020: Table 3.1). The breakdown of electricity use and related emissions by facility type or use is shown in Table 4.

Table 4 Electricity Usage and GHG Emissions by County Facility or Use (2019)

Facility/Use	kWh/year	$MTCO_2e$
Airports	886, 860	200
Buildings & Other Facilities	106,240,927	24,025
Public Lighting	5,584,777	1,263
Water Pumping	573,705	130
Total	**113,285,269**	**25,618**

Notes: Totals may not sum due to rounding.
GHG = greenhouse gas; kWh = kilowatt-hours; $MTCO_2e$ = metric tons carbon dioxide equivalent
Electricity usage data as shown in the Climate Registry Information System (CRIS) database

As shown in Table 4, the electricity consumption in County facilities varies by facility type or use. For airport[1] operations and County-owned and operated buildings[2], electricity is used for building operations such as lights, cooling, computers, and other devices. For airports, electricity is required to power runway lights, tower lights, and other airport-specific operations. For public lighting operations, electricity is needed to power streetlights, traffic signals, and other public lighting fixtures. For water pumping, electricity is used to power the pumps used to distribute water, convey wastewater to treatment plants, and redistribute storm water during the rainy season. Emissions from electricity use at airports and buildings and facilities are shown in rows 1a and 2a, respectively in Table 2. Emissions from electricity use for water pumping are shown in row 8a in Table 2.

4.2 NATURAL GAS

Natural gas consumption data for County facilities and operations in 2019 were available from natural gas purchase records inputted into the CRIS database. The CRIS database includes total therms of natural gas purchased for each facility which was used to generate GHG emissions shown in Table 5. In 2019, the County used 2,461,283 therms. To calculate GHG emissions associated with natural gas combustion, natural gas therms were converted to million British Thermal Units (MMBTU) and CO_2, CH_4, and N_2O natural gas emission factors (in grams per MMBTU) available from TCR's 2020 default emission factors were applied in CRIS. These emission factors are as follows: 53.06 kilograms (kg) CO_2/MMBTU, 4.7 grams (g) CH_4/MMBTU, and 0.1 g N_2O/MMBTU (TCR 2020: Table 1.1 and Table 1.10). Natural gas consumption in County facilities is primarily used in building furnaces, water heaters, and cooking activities. Natural gas consumption for County landfills is addressed in Section 4.10.2. Emissions from natural gas use at airports and buildings and facilities are shown in rows 1b and 2b, respectively in Table 2.

Table 5 Natural Gas Usage and GHG Emissions by County Facility (2019)

Facility	therms/year	$MTCO_2e$
Airports	4,447	24
Buildings & Other Facilities	2,456,836	13,601
Total	**2,461,283**	**13,624**

Notes: Totals may not sum due to rounding.
GHG = greenhouse gas; $MTCO_2e$ = metric tons carbon dioxide equivalent
Natural gas usage data as shown in the Climate Registry Information System (CRIS) database.

[1] Emissions from airports are generated by energy used in all airport operations (required to power runway lights, tower lights, and other airport-specific operations).
[2] Emissions from Buildings & Other Facilities are generated by energy used for building operations such as lighting, heating/cooling, computers, and other appliances.

4.3 FACILITY REFRIGERANT USE

Total annual refrigerant usage in County operations in 2019 was available for R-401A, R-404A, R-410A, and R-438A. These data were directly input into CRIS through purchase records. Emissions from refrigerants were assumed to be equal to purchase amounts. These refrigerants are blends of GHGs recognized by the IPCC. For example, R-401A is a blend of HCFC-22, HFC-152a, and HCFC-124 for which IPCC assigns GWP values of 1,810, 124, and 609, respectively, which results in a GWP factor of 1,182. Table 6 shows the quantity of each compound in 2019, the respective weighted GWP values, and metric tons of carbon dioxide equivalent emissions. The GWP factors for the four refrigerant types used by the County are from IPCC's Fourth Assessment Report (IPCC, 2007), obtained from CARB, which calculates the GWP factors based on the refrigerant blends (CARB 2023a). These factors were used to convert the refrigerant emissions to $MTCO_2e$. Emissions from refrigerants at buildings and facilities are shown in row 2c in Table 2.

Table 6 County Operations Refrigerant Use and GHG Emissions

Refrigerant	Gas Quantity (MT)[2]	GWP Factor[1]	$MTCO_2e$
R-401A	0.000454	1,182	0.5
R-404A	0.078921	3,922	307.8
R-410A	0.043633	2,088	91.1
R-438A	0.027758	2,265	62.9
Total			462.3

Notes:
[1] Source: IPCC Fourth Assessment Report (IPCC, 2007).
[2] Source: CRIS inventory.

4.4 FACILITY DIESEL USE

The total annual diesel fuel usage in the County's emergency generators at County buildings and facilities in 2019 was 9,298 gallons. Diesel usage data for diesel consumption in building facilities (except airport ground support equipment (GSE) were available from diesel fuel purchase records recorded in CRIS. Airport GSE consumed 94 gallons of diesel. This data was provided by the County Airport team. Diesel combustion emission factors (in kg per gallon [gal] and g per MMBTU) were applied to the total volume of purchased fuel and fuel energy content for Distillate Fuel Oil No. 2 from the TCR's default emission factors. These emission factors are as follows: 10.21 kg CO_2/gal, 10 g CH_4/MMBTU, and 0.6 g N_2O/MMBTU (TCR 2020: Table 1.1, Table 1.10). Emissions from diesel use at airports and buildings and facilities are shown in rows 1c and 2d respectively in Table 2.

4.5 FACILITY PROPANE USE

Similar to diesel usage, propane use at County buildings and facilities (except airport GSE) was recorded in CRIS from County purchase records, and airport GSE propane consumption data were provided by the County airport team. Propane-specific emission factors were applied to the total amount of propane used in 2019.

The total annual propane usage was 4,682 gallons in the County's emergency generators at County buildings and facilities and 38 gallons for airport GSE in 2019. Propane combustion emission factors (in kg per gallon and g per MMBTU) were applied to the total volume of purchased fuel and fuel energy content for liquid propane from the TCR's default emission factors. These emission factors are as follows: 5.72 kg CO_2/gal, 10.02 g CH_4/MMBTU, and 0.6 g N_2O/MMBTU (TCR 2020: Table 1.1, Table 1.10). Emissions from propane use at airports and buildings and facilities are shown in rows 1d and 2e respectively in Table 2.

4.6 VEHICLE FLEET FUEL USE

The County's vehicle fleet operated on gasoline, diesel, renewable diesel, and electricity in 2019. This included both on-road and off-road vehicle fleets and equipment, such as construction equipment. Airport GSE data were separately provided by the County airports team. Fuel use and mileage by vehicle type was recorded into CRIS from County records and fuel-specific or vehicle-specific emission factors from TCR were applied to estimate vehicle fleet emissions in 2019. These emissions are shown in rows 4a through 4d in Table 2. In 2019, the County fleet used 2,476,087 gallons of gasoline, 3,702 gallons of diesel, 439,135 gallons of renewable diesel, and 53,889 kWh of electricity. Emissions from the County fleet were recorded in the CRIS inventory.

4.7 EMPLOYEE COMMUTE

Emissions from the County's employee commute activity were estimated based on a zip code database provided by the County that provided the home and work zip codes for each employee anonymously, as well as indicated whether the employee was regularly or temporarily employed. It was assumed that employees would use a mix of light duty auto and light duty trucks for commuting, based on a County-average vehicle mix from EMFAC 2021. The one-way driving distance between two zip codes was calculated through multiple steps. First, the zip code pairs were geocoded using Google Maps by plotting addresses to estimate the Euclidean distance between zip code pairs. The distance between each pair reflects the one-way driving distance between the home and work address of each employee.

The calculations assume that vehicle trips would occur twice per day for net working days[3] in 2019 (one trip from home to work, and one trip from work to home). The analysis assumes that the number of working days for temporary (or part-time) employees is half of the total working days for regular (or full-time) employees. For the purposes of this inventory, full-time employees are assumed to have 23 days off work per year (eleven holidays, two floating holidays, and ten days of vacation), while part-time employees are assumed to have 11 days off in a year. The net working days for the full-time and part-time employees was calculated based on the total number of working days in 2019 and the assumed amount of time off work. The net working days in 2019 was the commute trip frequency for employees. The calculated commute trip frequencies combined with the individual one-way trip lengths allowed for the calculation of total employee commute vehicle miles traveled (VMT). County employee commute vehicle trips are summarized in Table 7.

Table 7 2019 County Employee Commute Vehicle Trips

Employee Type	Number of Employees[1]	Annual VMT[2]
Full-Time/Regular	16,033	92,925,297
Part-Time/Temporary	2,793	8,650,378
Total	18,826	101,575,675

Notes: VMT = vehicle miles traveled
[1] The 2019 employment figures were provided by the County.
[2] Based average driving distance between home and work zip codes.

Emission factors from EMFAC 2021 for gasoline, diesel, and plug-in hybrid for light duty autos and trucks were applied to total VMT to estimate annual emissions from employee commute (shown in Table 8). It is assumed that EVs are not charged exclusively at County facilities and are also charged at employee's residences, hence countywide electricity emissions factors are used for calculating emissions for EVs from home-based charging. Emissions from County employee commute are shown in row 3 in Table 2 and Table 8 shows emission factors used for estimating emissions from employee commute.

[3] Net working days indicates the total working days in a year minus number of days off for holidays, vacation, and/or sick leave.

Table 8 2019 Employee Commute Emission Factors from EMFAC 2021

Fuel Type	Percent Breakdown for LDA and LDT Vehicle Types in San Diego County	Emission Factor (g CO_2/mi)	Emission Factor (g CH_4/mi)	Emission Factor (g N_2O/mi)	Emission Factor (lb/CO_2e)
Diesel	0.67%	367.62	0.002	0.058	
Electricity[1]	1.01%	--	--	--	645
Gasoline	97.28%	382.19	0.021	0.014	
Plug-in Hybrid	1.04%	169.57	0.004	0.003	

Note: CH_4=methane; CO_2 = carbon dioxide; CRIS= Climate Registry Information System; g = grams; GHG = greenhouse gas; LDA= light duty auto; LDT = light duty truck; MDV = medium duty vehicle; mi = miles; MT = metric tons; N_2O=nitrous oxide

[1] Assumes county wide electricity emission factors. Electric load from EVs is accounted in electricity sector (Section 4.1).

Note: Based on San Diego County mix of LDA, LDT, MDV and motorcycle vehicle classes.

Source: EMFAC 2021.

4.8 WATER

Emissions from the County's water pumping facilities are reported in the CRIS inventory and are shown in row 8b in Table 2. Emissions from water used at County facilities are not reported in the CRIS inventory and are calculated separately. To capture the emissions associated with water use not served by the County's own pumps, annual water usage data from facilities located in the unincorporated areas and non-unincorporated area (394,890,322 gallons per year) was multiplied by a water energy intensity factor (292 kWh per million gallon) to get annual electricity usage required for facility water use. This water energy intensity factor was based on the average of City of San Diego's three Water Treatment Plants.

Total indirect electricity use from the water use in County facilities was 115 MWh per year in 2019. To calculate emissions from this indirect electricity use, a factor of 645 lb CO_2e/MWh was applied to the calculated electricity use, consistent with community-wide averages, for a total of 34 $MTCO_2$e in 2019 (see Section 4.2.2 of the *County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections)*.

4.9 WASTEWATER FACILITIES

Emissions from wastewater facilities are from two sources: nitrification-denitrification process (shown in row 7b in Table 2) and electricity use (shown in row 7a in Table 2) at facilities. Emissions from electricity use at wastewater facilities in 2019 were available from electricity purchase records input into the CRIS database. CRIS reported N_2O emissions from nitrification-denitrification in County-owned and operated wastewater treatment facilities using Equations 10.7 and 10.8 from the LGOP. These equations are based on total population served by the wastewater treatment facility and whether the treatment facility has a nitrification-denitrification process or not. Wastewater facilities that are owned and/or operated by the County are Heise Park Plant, Julian Plant, Pine Valley Plant, Rancho Del Campo Plant, and San Pasqual Plant. These facilities treat wastewater aerobically and, therefore, do not emit CH_4 emissions.

4.10 LANDFILL EMISSIONS

4.10.1 Purchased Electricity

Emissions from electricity use at landfill facilities in 2019 were available from electricity purchase records input into the CRIS database. The CRIS database includes total annual kWh for each facility, which was used to estimate associated GHG emissions (shown in row 5c in Table 2). To calculate GHG emissions associated with electricity generation, the USEPA's eGRID electricity emission factors for CO_2, CH_4, and N_2O for the WECC California region were applied to consumption data. These emission factors are as follows: 496.5 lb CO_2/MWh, 34 lb CH_4/GWh, and 4 lb N_2O/GWh (TCR 2020: Table 3.1). Emissions from electricity use at landfills are shown in row 5c in Table 2.

4.10.2 Natural Gas

Natural gas consumption data for landfill facilities in 2019 were available from natural gas purchase records input into the CRIS database. The CRIS database includes total therms of natural gas purchased for each facility which was used to generate GHG emissions (shown in row 5d in Table 2). To calculate GHG emissions associated with natural gas combustion, emission factors from TCR's 2020 default emission factors were applied in CRIS. These emission factors are as follows: 53.06 kg CO_2/MMBTU, 4.7 g CH_4/MMBTU, and 0.1 g N_2O/MMBTU (TCR 2020: Table 1.1 and Table 1.10). Emissions from natural gas use at landfills are shown in row 5d in Table 2.

4.10.3 Fugitive Emissions

The landfill emissions only include landfills that are closed, as the County does not own or operate any active landfills. Bell Junior High, Encinitas, Gillespie, Hillsborough, Palomar, Poway, San Marcos landfills are located in incorporated cities, while Valley Center, Jamacha, Bonsall, and Viejas landfills are located in the unincorporated area.

CRIS reported fugitive CH_4 emissions in 2019 from 10 out of 11 landfills owned and operated by the County. Emissions from Viejas Landfill were calculated separately. For all landfills, except the Viejas Landfill, fugitive CH_4 emissions were calculated using Equation 9.1 from the LGOP (CARB 2010). This equation is specific to landfills with comprehensive landfill gas (LFG) collection systems and calculates emissions based on annual LFG collected, destruction efficiency, and assumed percent of CH_4 in the LFG. The GWP factor for CH_4 was applied to the total estimated CH_4 emissions from County-owned and operated landfills to calculate the CO_2 equivalent emissions.

Fugitive landfill CH_4 emissions from the Viejas Landfill were calculated using CARB's Landfill Gas Tool (LGT) (updated September 24, 2021) (CARB, 2021). The default values for the percent of anaerobically degradable carbon (ANDOC) in California were used in the LGT. This model calculates CH_4 from a landfill for a given year based on rainfall, opening year, closure year, tons of annual waste disposed, and tons of alternative daily cover (ADC). The landfill is located in San Diego County, which has an average rainfall of less than 20 inches per year (Western Regional Climate Center 2009). Also, the Viejas Landfill is assumed not to have had applied any ADC during its operation (Forga, pers. comm., 2016). A 2014 facility emissions report, which did not report CH_4 emissions, from the San Diego Air Pollution Control District noted that the Viejas Landfill opened in 1971, closed in 1979, and has a final landfill size of 46,000 tons (San Diego Air Pollution Control District 2014). Assuming that the landfill was closed due to maxed capacity and that waste was disposed at the landfill at equal rates during each year of operation, LGT estimates that the Viejas Landfill generated 22 metric tons of CH_4 in 2019. In addition, no landfill gas capture or flaring systems are currently installed at Viejas Landfill; therefore, this landfill generated no flaring or pilot light-related emissions. Fugitive emissions from landfills are shown in row 5a in Table 2.

4.10.4 Pilot Light

Pilot lights used to start flaring events at LFG capture sites require a minimal amount of fuel to stay lit. CO_2 emissions from each landfill were precalculated and entered into CRIS. Emissions from pilot lights at landfills are shown in row 5b in Table 2.

4.10.5 Flared Gas Emissions

Some LFG is flared onsite, resulting in GHG emissions. CRIS does not report CO_2 emissions from combustion of LFG. CH_4 and N_2O emissions from the combustion of LFG in flares are reported in CRIS and included in this inventory. Flared gas emissions at landfills are shown in row 5e in Table 2.

4.11 SOLID WASTE

To quantify emissions from employee-generated solid waste, a solid waste emissions factor was calculated for waste generated from the City of San Diego in 2019. This approach, as opposed to one calculated specifically for the unincorporated county, was chosen because most of the County's offices are in the City of San Diego.

According to CalRecycle, waste generated by the residents and businesses of City of San Diego mostly ended up in landfills located outside of the unincorporated county, with the exception of Otay Landfill, which received 24 percent of the waste generated by the City of San Diego (CalRecycle 2022). County employee-generated solid waste calculations are summarized in Table 9.

Total waste generated by County employees in 2018 was available from the County's Internal Operations Waste Diversion Phased Implementation Plan 2019. Waste generated by employees in 2019 was estimated by applying the employee growth factor from 2018 to 2019 to the total waste generated in 2018. The emissions factor, 0.221 MTCO2e per ton of solid waste generated, was calculated using Equation SW.4.1 from the U.S. Community Protocol and the factors shown in Table 9 (ICLEI 2012). The percentage of accepting landfills that have LFG capture was calculated by looking up Otay, Sycamore, and West Miramar Landfills in USEPA's Landfill Methane Outreach Program (USEPA 2023). These three landfills accepted over 99 percent of waste from the City of San Diego in 2019 and all operated LFG capture systems in 2019 (USEPA 2023). Solid waste emissions from County facilities are shown in row 9 in Table 2.

Table 9 2019 County Employee-Generated Solid Waste Emissions

Employee-Generated Solid Waste	
Tons of Landfilled Solid Waste generated by County facilities in 2018[1]	12,529
Full-time Equivalent County Government Employees in 2018[2]	16,938
Full-time Equivalent County Government Employees in 2019[2]	17,172
Tons of solid waste generated per employee	0.74
Tons of Landfilled Solid Waste generated by County facilities in 2019	12,702
Waste Generation Emissions Factor[3]	
Average Emissions Factor for Municipal Solid Waste ($MTCH_4$/ton)	0.06
Oxidation Rate (%)	1%
Minimum percent of landfills accepting waste from City of San Diego that have LFG Capture[4] (%)	99%
Landfill Gas Capture Rate (%)[5]	85%
Calculated Average Emissions Factor for Municipal Solid Waste in the City of San Diego ($MTCH_4$/ton)	0.221
Emissions from Employee-Generated Solid Waste	
GHG Emissions from Employee-Generated Solid Waste ($MTCO_2e$/year)[6]	2,812

Notes: Manual calculations of using figures shown may not equal results due to rounding of individual figures.
CH_4 = methane; CO_2e = carbon dioxide equivalents; MT = metric tons
[1] County of San Diego Internal Operations Waste Diversion Phased Implementation Plan 2019
[2] County of San Diego, Annual Comprehensive Financial Report for Fiscal Year ended June 30, 2022 (San Diego County, 2022b).
[3] Based on methodology recommended in the U.S. Community Protocol (ICELI 2012: Table SW.5).
[4] Based on the existence of LFG capture systems at Otay, Sycamore, and West Miramar Landfills that serve the majority of the City of San Diego. (CalRecycle 2022, USEPA 2023)
[5] San Diego County Air Pollution Control District (n.d.)
[6] Based on a CH_4 global warming potential factor of 25.
Source: CalRecycle 2022, ICLEI 2012, USEPA 2023, San Diego County, 2022c.

5 COMPARISON OF COUNTY OPERATIONS INVENTORIES FOR 2014 AND 2019

The 2019 County Operations Inventory shows that annual GHG emissions from County operations decreased by approximately 31 percent relative to annual GHG emissions from County operations in 2014 due, in part, to policies and programs designed to reduce GHG emissions, such as 2018 CAP measures that reduce emissions from County operations. Table 10 compares annual GHG emissions in 2014 and 2019 for each source included in the County operations inventory.

Table 10 Percent Change in County of San Diego Operation Emissions in 2019 relative to 2014

Source	2014 County Operations GHG Inventory ($MTCO_2e$)	2019 County Operations GHG Inventory ($MTCO_2e$)	Percent Change from 2014
Airports	322	225	-30%
Buildings & Other Facilities	63,583	38,210	-40%
Employee Commute	55,836	38,803	-31%
Vehicle Fleet	26,164	26,612	2%
Landfills	41,750	24,139	-42%
Public Lighting	2,880	1,263	-56%
Wastewater Facilities[1]	5	30	514%
Water	309	163	-47%
Solid Waste	2,126	2,812	32%
Total	192,976	132,257	-31%

Changes in energy consumption (e.g., electricity, natural gas, gasoline, diesel) and activities (e.g., miles of vehicle travel, water use, and solid waste generation) account for some of the differences in annual GHG emissions between the 2014 and 2019 County operations inventories. Table 11 compares activity data inputs used in the 2014 and 2019 inventories.

Table 11 Change in County Operations Energy and Activity Data by Facility Type in 2019 from 2014

Facility Type/ Source Type	2014 Energy/Activity Data	2019 Energy/Activity Data	Units	% Change, 2014-2019
Airports				
Electricity Use	755,238	885,860	kwh	17%
Natural Gas	6,730	4,447	therm	-34%
Diesel	N/A	94	gal	N/A
Propane	N/A	38	gal	N/A
Buildings & Other Facilities				
Electricity Use	133,836,900	106,240,927	kwh	-21%
Natural Gas	2,334,004	2,456,836	therm	5%
Refrigerants	N/A			
Diesel	10,052	9,298	gal	-8%
Propane	2,821	4,682	gal	66%
Employee Commute	155,043,720	101,575,675	VMT	-34%
Vehicle Fleet				
Fuel: Electricity[1]	N/A	53,889	MWh	N/A
Fuel: Gasoline	2,475,012	2,476,087	gal	0%
Fuel: Diesel	391,738	3,702	gal	-99%

Fuel: Renewable Diesel[1]	N/A	439,135	gal	N/A
Fuel: CNG	6,132	N/A	therm	N/A
Landfills				
Fugitive Emissions (including Viejas Landfill)	N/A			
Pilot Light	N/A			
Purchased Electricity	N/A	356,123	kwh	N/A
Natural Gas	N/A	16,262	therm	N/A
Flared Gas	N/A			N/A
Public Lighting				
Electricity Use	7,594,078	5,584,777	kWh	-26%
Wastewater Facilities				
Electricity Use	N/A	118,535	kWh	N/A
Process Emissions	N/A			N/A
Water				
Water Pumps	738,955	573,705	kWh	-22%
Water Use at Facilities	326,849,163	394,890,322	gal	21%
Solid Waste				
Employee Generated Solid Waste[2]	5,227	12,702	tons	143%

Notes: N/A indicates that no fuel quantity was reported for this source.
1 County's vehicle fleet did not operate on this fuel in 2014
2 Significant increases in 2019 emissions due to change in methodology

6 GREENHOUSE GAS EMISSIONS PROJECTIONS

The following sections outline the methodologies used in projecting GHG emissions for each source applicable to the County's inventory for 2030 through 2050. Methods used to project emissions vary by source as detailed in the following sections.

Emissions projections were prepared for legislative-adjusted business-as-usual scenarios for 2030, 2035, 2040, 2045, and 2050. These projections account for the County's future population growth, County operation plans, and future emissions reductions pursuant to State and federal laws, regulations, and other actions to reduce GHG emissions, including the Renewables Portfolio Standard (RPS), improving vehicle fuel economy standards due to Advanced Clean Cars II, and other State and federal policies. Table 12 shows the County's operations GHG inventory for the baseline year of 2019 and GHG projections for 2030 through 2050 at five-year increments.

Table 12 County of San Diego Operations Baseline and GHG Projections

Serial Number	Source[1]	Emissions ($MTCO_2e$)					
		2019	2030	2035	2040	2045	2050
1	Airports						
a.	Electricity Use	200	-	-	-	-	-
b.	Natural Gas	24	32	35	39	43	46
c.	Diesel Fuel	0.96	1.0	1.1	1.1	1.1	1.2
d.	Propane	0.2	0.2	0.2	0.2	0.3	0.3
	Subtotal	225	33	37	40	44	48

2	Buildings & Other Facilities						
a.	Electricity Use	24,025	-	-	-	-	-
b.	Natural Gas	13,601	13,860	14,218	14,576	14,934	15,293
c.	Refrigerants	462	496	511	526	541	556
d.	Diesel Fuel	95	102	106	109	112	115
e.	Propane	27	29	30	31	32	32
	Subtotal	38,210	14,487	14,864	15,242	15,619	15,996
3	Employee Commute						
a.	Vehicle Miles Travelled	38,803	31,743	22,372	13,159	13,603	14,064
4	Vehicle Fleet						
a.	Fuel: Electricity	12	4	1	0	-	-
b.	Fuel: Gasoline	22,055	16,873	11,574	7,134	6,891	6,593
c.	Fuel: Diesel	61	62	61	61	62	64
d.	Fuel: Renewable Diesel	4,484	6,574	6,808	7,087	7,462	7,985
	Subtotal	26,612	23,512	18,443	14,283	14,416	4,642
5	Landfills						
a.	Fugitive Emissions (including Viejas Landfill)	23,918	19,198	17,371	15,724	14,224	2,868
b.	Pilot Light	2	2	2	2	2	2
c.	Purchased Electricity	81	-	-	-	-	-
d.	Natural Gas	87	97	101	104	107	110
e.	Flared Gas	52	42	38	34	31	28
	Subtotal	24,139	19,339	17,511	15,864	14,364	13,008
6	Public Lighting						
a.	Electricity Use	1,263	-	-	-	-	-
7	Wastewater Facilities						
a.	Electricity Use	27	-	-	-	-	-
b.	Process Emissions	3	3	3	3	3	4
	Subtotal	30	3	3	3	3	4
8	Water						
a.	Water Pumps	130	-	-	-	-	-
b.	Water Use at Facilities	34	10	2	1	-	-
	Subtotal	163	10	2	1	-	-
9	Solid Waste						
a.	Employee Generated Solid Waste	2,812	2,471	2,583	2,681	2,775	2,873
	TOTAL	132,259	91,600	75,817	61,274	60,826	60,636
	Percent Change from 2019 (%)	0%	-31%	-43%	-54%	-54%	-54%

Notes:
"-" means zero emissions.
CO2e = carbon dioxide equivalents; MT = metric tons.
Values may not equal totals due to rounding.

Source: Data compiled and adjusted by Ascent in 2023

6.1 ELECTRICITY

Electricity use at County facilities in 2030 was projected based on capital projects identified in the County's *Adopted Operational Plan Fiscal Years 2022-23 & 2023-24* (County of San Diego 2022a). For projections beyond 2030 and through 2050, it was assumed that the trends between 2019 and 2030 would continue into the future at the same growth rate.

According to the County's plans, the County anticipates construction of several new facilities. With respect to airport facilities, the Airport Capital Improvement Plan (ACIP) includes the construction of an aircraft rescue and firefighting building (anticipated in fiscal year 2026). The project is located at McClellan-Palomar Airport and is anticipated to be approximately 4,700 square feet. Electricity use associated with public lighting was projected based on projects identified in the County's *Five-Year Capital Improvement Plan Fiscal Years 2022-23 & 2023-24* (County of San Diego 2022). Indirect electricity consumption associated with the County's water facilities was scaled based on population growth in unincorporated county from 2019 through 2050. Table 13 shows the anticipated facility projects and associated changes through 2030. The County plans used to prepare this analysis do not extend beyond 2030.

Table 13 Anticipated County Facility Changes between 2019 and 2030

Project	Type of Change	Size				Completion Year
		New SF	New Acres	New Miles	New Linear feet	
Casa De Oro Library	New Facility	13,000	--	--	--	2024
Youth Transition Campus	New Facility	147,575	--	--	--	2024
East Otay Mesa Fire Station #38	New Facility	14,000	--	--	--	2023
San Diego County Animal Shelter	New Facility	25,000	--	--	--	2024
Third Avenue Mental Health Inpatient Facility (Central Regional Hub)	New Facility	206,000	--	--	--	2025
Julian Library Community Room	New Facility	2,900	--	--	--	2022
Ramona Sheriff Station	New Facility	18,000	--	--	--	2025
East Otay Mesa Sheriff Station	New Facility	25,000	--	--	--	2027
Santee Library	New Facility	25,000	--	--	--	2030
San Marcos Library	New Facility	20,000	--	--	--	2030
Jacumba Fire Station #43	New Facility	5,500	--	--	--	2030
Campo Library Community Room	Expansion	1,000	--	--	--	2027
I-15 and SR-76 Sheriff Station	New Facility	25,000	--	--	--	2030
Santee Public Safety Center	New Facility	25,000	--	--	--	2030
North Coastal Sheriff Station	New Facility	37,000	--	--	--	2030
South County Animal Shelter (San Diego County)	New Facility	20,000	--	--	--	2024
Dye Road Extension	Expansion	--	--	1.2	--	2025
Ramona Street Extension - Road Extension	Expansion	--	--	--	1,700	2024
McClellan-Palomar Airport - Aircraft rescue and firefighting building	New Facility	4,700	--	--	--	2030

The estimated future electricity use in 2030 was based on the additional facilities and improvements shown in Table 13. CalEEMod Version 2022.1 was used to estimate the additional electricity demand based on the types and sizes of the new or expanded facilities. CalEEMod modeling estimated that the additional facilities and improvements, if built by 2030, would require approximately 78 MWh more per year over 2019 conditions. In addition, some roadway construction and extensions will require additional public lighting. Based on San Diego County's street design manual (San Diego County, 2016), on road extensions in neighborhoods, the streetlights are spaced 300 feet apart.

Assuming an average wattage of 150 watts per LED streetlight operating eight hours per day, new public lighting needs would add approximately 12 MWh per year to current lighting electricity demands as of 2019. The additional employee estimates are used to project other emissions sources, such as employee commutes. Electricity from water use is anticipated to increase as the number of County employees increases.

Emissions from future electricity use were estimated by multiplying anticipated electricity use with the projected emission factors. Emission factors are based on the electric power mix. The projections assume that electricity emission factors would decline in 2030 because in 2030, the County will purchase 100 percent renewable electricity, 90 percent of which would come from Direct Access and 10 percent would come from San Diego Community Power (Kelly, pers. comm., 2021). Between 2019 and 2050, electricity emissions for County operations would decrease despite electricity use increasing through 2050 because of the increased use of electricity generated from renewable or zero emission sources. Emission projections from electricity use at airports and buildings and facilities are shown in rows 1a and 2a respectively in Table 12. Emission projections from electricity use for water pumping are shown in row 8a in Table 12.

6.2 NATURAL GAS

Natural gas consumption was projected using similar methodologies as used for electricity. Natural gas use at County facilities in 2030 was projected based on capital projects identified in the County's *Adopted Operational Plan Fiscal Years 2022-23 & 2023-248* (County of San Diego 2022a) and the County's *Airport Capital Improvement Plan Fiscal Years 2020-2021* (ACIP) (County of San Diego, 2020). For projections through 2050, it was assumed that the trends between 2019 and 2030 would continue into the future.

The estimated future natural gas use in 2030 was based on the additional facilities and improvements shown in Table 13. CalEEMod version 2022.1 was used to estimate the additional natural gas demand based on the types and size of the new or expanded facilities. CalEEMod modeling estimated that the additional facilities, if built by 2030, would require approximately an additional 1,505 therms per year over 2019 conditions.

Emissions from future natural gas use were estimated by multiplying projected natural gas use with the natural gas emission factor identified in Section 4.2. Between 2019 and 2050, natural gas emissions in the County are projected to increase. Emission projections from natural gas use at airports and buildings and facilities are shown in row 1b and 2b respectively in Table 12.

6.3 FACILITY REFRIGERANT USE

Refrigerant use in buildings and facilities is associated with heating, ventilation, and air conditioning (HVAC) systems and refrigeration needs. These uses can be correlated with electricity use in buildings and facilities. Therefore, refrigerant use in County facilities through 2050 was scaled by change in building and facility electricity use from 2019 through 2050. Refrigerant emissions would be expected to increase with growth in buildings and facilities and are best captured using electricity use forecast. Emissions were estimated using the emission factors identified in Section 4.3. Emissions from annual refrigerant usage in County buildings and facilities are projected to slightly increase between 2019 and 2050 and shown in row 2c in Table 12.

6.4 FACILITY DIESEL USE

Diesel fuel use in the County's emergency generators at County buildings and facilities was scaled by change in buildings and facilities electricity use from 2019 to 2050. Emissions were estimated using emission factors identified in Section 4.4. Emissions associated with annual diesel fuel usage in the County's emergency generators at County buildings and facilities are projected to increase slightly between 2019 and 2050. Emission projections from diesel use at airports and buildings and facilities are shown in row 1c and 2d respectively in Table 12.

6.5 FACILITY PROPANE USE

Similar to refrigerant and diesel emissions, propane use at County buildings and facilities was projected by scaling to the change in the County buildings and facilities electricity use from 2019 to 2050. Emissions were estimated using emission factors identified in Section 4.5. Emissions associated with annual propane fuel usage at County buildings and facilities are projected to increase slightly between 2019 and 2050. Emission projections from propane use at airports and buildings and facilities are shown in row 1d and 2e respectively in Table 12.

6.6 VEHICLE FLEET FUEL USE

The County's vehicle fleet operations include gasoline, diesel, renewable diesel, and electricity-fueled on-road and off-road vehicles and equipment. Future electric vehicle fleet fuel use through 2050 is based off projected changes in community-wide electricity emission factors, assuming that electric vehicles are not exclusively charged at County facilities and are also charged at public charging stations in the county. Future vehicle fleet gasoline and diesel fuel use through 2050 is based on projected changes in community-wide vehicle fleet emission factors in EMFAC 2021 for the vehicle categories specific to the County's vehicle fleet.

Additional renewable diesel usage due to new construction activities anticipated in Table 13 was added to 2030 projections, based on CalEEMod construction modeling results. CalEEMod estimated that an additional 2,090 $MTCO_2e$ would result from the construction of the new facilities. EMFAC 2021 does not account for Advanced Clean Cars II (ACCII) regulations, which were incorporated separately. Reduction in passenger vehicle emissions due to ACCII were applied using the ACCII impact factor data for passenger vehicles provided by the CARB EMFAC team. The methodology is consistent with the community-wide inventory and more details can be found in section 6.1.1.2 in the Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections report. Emissions from passenger vehicles are anticipated to decline by 70 percent between 2019 and 2050 based on EMFAC2021 projections, ACCII regulations, and assuming a vehicle turnover rate that is similar to the County's community-wide average. These emission projections are shown in row 4 in Table 12.

6.7 EMPLOYEE COMMUTE

The 2019 employee commute VMT was scaled to 2050 using the anticipated employee growth through 2050 using government job forecast from SANDAG Series 14 Regional Growth Forecast (SANDAG, 2021). Percentage of fuel use from EMFAC 2021 was applied to the total VMT to determine VMT for diesel, gasoline, electric, and plug-in hybrid fueled vehicles. The employee commute emission factors were scaled based on the change in EMFAC 2021 emission factors from 2019 to 2050 for passenger vehicles. The additional electric load from new Zero Emission Vehicles (ZEVs) from EMFAC2021 is also included in the employee commute forecast. EMFAC 2021 does not account for ACCII regulations, which were incorporated separately. Reduction in passenger vehicle emissions due to ACCII were applied using the ACCII impact factor data for passenger vehicles provided by the CARB EMFAC team. Only light-duty vehicles are subject to ACCII, so the emissions benefits from ACCII were applied only to light-duty vehicles in the county. The additional electric load due to the new ZEVs from ACCII was not estimated due to lack of electricity load data. However, in 2045 when the electricity supply is mandated to be zero-emissions, any ZEV will have zero impact on electricity emissions. The methodology is consistent with the community-wide inventory and more details can be found in section 6.1. 2 in the 2019 Unincorporated County of San Diego 2019 Inventory and Projections report. Emission projections from County employee commute are shown in row 3 in Table 12.

6.8 FACILITY WATER USE

Indirect emissions from water use in facilities in 2019, shown in Section 4.8, were scaled to 2050 using government job forecast from SANDAG Series 14 Regional Growth Forecast (SANDAG, 2021). Based on this extrapolation, the indirect emissions from water use are projected to increase slightly between 2019 and 2050. Emission projections from facility water use are shown in row 8b in Table 12.

6.9 WASTEWATER FACILITIES

The wastewater facilities' emissions were scaled to the anticipated growth in unincorporated county population through 2050 provided by SANDAG. Although changes in wastewater treatment technology could affect the N_2O emission factors and the County's five-year plan allots funding to upgrades at wastewater treatment plant, the plan does not specify the type of improvements that may occur (County of San Diego 2020). Thus, wastewater emissions factors are assumed to remain constant in the future on a per-gallon basis of wastewater generated. Also, due to the small magnitude of emissions in this sector, emissions are not anticipated to measurably change from 2019 levels. Emission projections from wastewater facilities are shown in row 7b in Table 12.

6.10 LANDFILL EMISSIONS

6.10.1 Purchased Electricity

Electricity use at landfills was scaled to the anticipated County employee growth in 2030 through 2050 using government job forecast from SANDAG Series 14 Regional Growth Forecast (SANDAG, 2021). Emissions were estimated by multiplying anticipated electricity use with the projected electricity emission factors.

The projections assume that electricity emission factors would decline in the future because beginning in 2030, the County will purchase 100 percent renewable electricity, 90 percent of which would come from Direct Access and 10 percent would come from San Diego Community Power. Emission projections from electricity use at landfills are shown in row 5c in Table 12.

6.10.2 Natural Gas

Natural gas use at landfills was projected based on growth in County employees by 2030 through 2050 using government job forecast from SANDAG Series 14 Regional Growth Forecast (SANDAG, 2021). Emissions were estimated by multiplying anticipated natural gas use with the projected natural gas emission factors. Between 2019 and 2050, natural gas emissions from landfills are projected to increase. Emission projections from natural gas use at landfills are shown in row 5d in Table 12.

6.10.3 Fugitive Emissions

Over time, CH_4 emissions produced by closed landfills decrease as the finite organic matter within the landfills is slowly converted to CH_4 through decomposition via a growth pattern similar to a bell-shaped curve. The CARB's LGT models the decay in organic matter, rate of conversion to CH_4, and subsequent reduction in CH_4 emissions before and after closure of a landfill. To calculate emissions, this model requires historical annual tonnage data. Historical tonnage data were readily available for the Encinitas, Palomar, San Marcos, and Viejas Landfills, but not for the other landfills under the County's jurisdiction. The rates of decay for these landfills were used to project emissions from the other closed landfills owned and/or operated by the County. Based on these results, emissions from currently closed landfills would generate approximately 46 percent less emissions by 2050 than in 2019 due to the decomposition of organic matter over time. The CH_4 emission factors for 2030 through 2050 were based on the decay rate, and emissions were calculated using the Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections.

The actual emissions projections from LGT were not used due to the inconsistency between LGT's results and estimated emissions from CRIS for the baseline GHG emissions inventory. The inconsistency between the CRIS and LGT emissions estimates is due to the difference between LGT's theoretical approach based on historical waste tonnage and CRIS' empirical approach, using LFG collection rates available directly from the Encinitas, Palomar, San Marcos, and Viejas landfills and Equation 9.1 from the LGOP. Fugitive emission projections from landfills are shown in row 5a in Table 12.

6.10.4 Pilot Light

Pilot lights used to start flaring events at LFG capture sites require a minimal amount of fuel to stay lit. The emissions associated with the pilot light are not anticipated to change between 2019 and 2050 as this technology is not expected to advance in this timeframe. Emission projections from pilot lights in landfills are shown in row 5b in Table 12.

6.10.5 Flared Gas

Flared gas emissions from County landfills were projected based on change in fugitive CH_4 emissions from municipal landfills with landfill gas capture. The flared gas emissions decreased from 52 $MTCO_2e$ in 2019 to 28 $MTCO_2e$ in 2050. Flared gas emission projections in landfills are shown in row 5e in Table 12.

6.11 SOLID WASTE

Employee-generated solid waste emissions in 2019, shown in Section 4.11, were projected based on growth in County employees in 2030 through 2050 using government job forecast from SANDAG Series 14 Regional Growth Forecast (SANDAG, 2021). As a result, the employee-generated solid waste emissions are projected to increase between 2019 and 2050. This projection assumes that the emissions rates, based on the off gassing of methane from the top layer of the landfill, per-ton of generated waste would remain unchanged. Solid waste emission projections from County facilities are shown in row 9 in Table 12.

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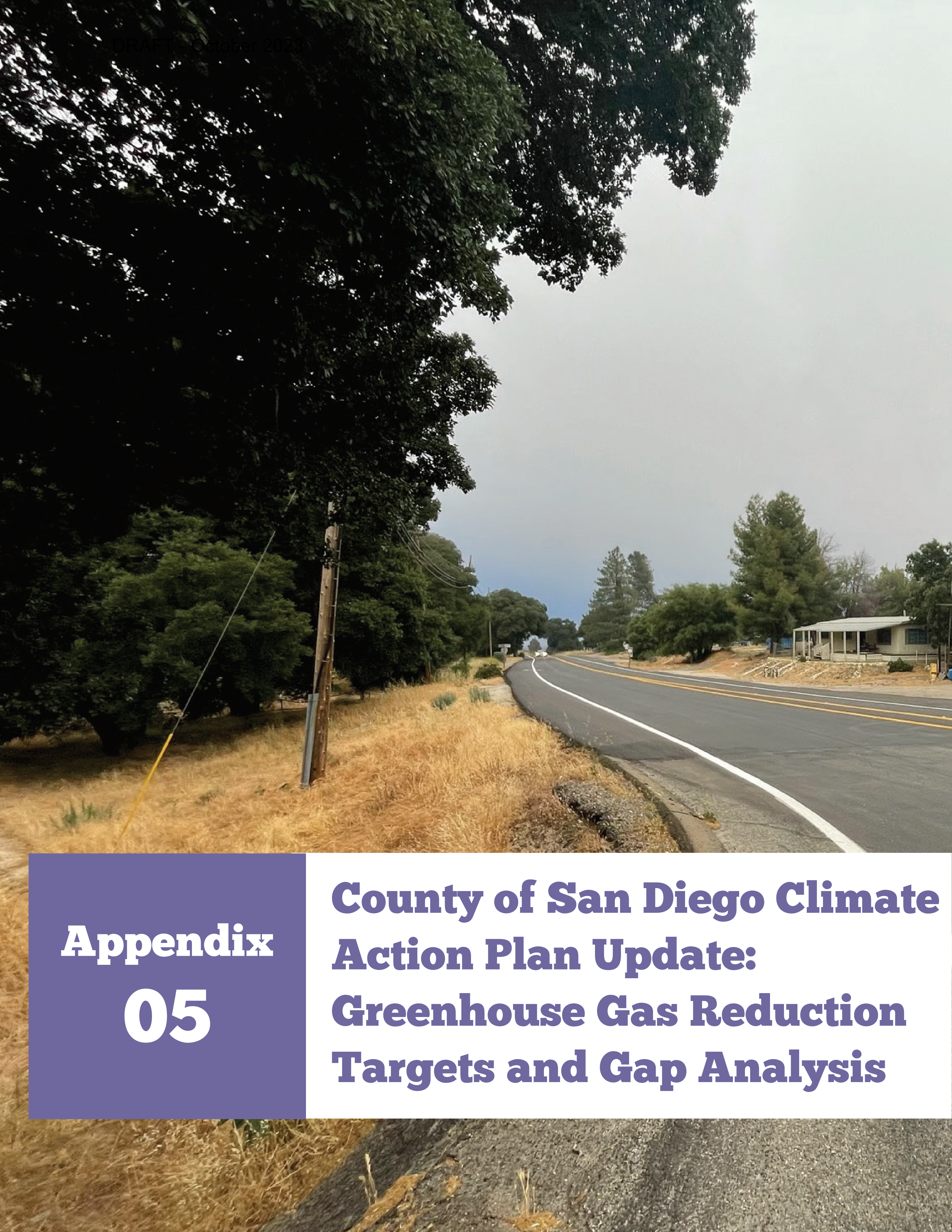
DRAFT – October 2023



Appendix

05

County of San Diego Climate Action Plan Update: Greenhouse Gas Reduction Targets and Gap Analysis

Memo

1230 Columbia St, Suite 440
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Date: October 10, 2023

To: Meghan Kelly (County of San Diego)

From: Andrew Martin and Poonam Boparai (Ascent)

Subject: County of San Diego Climate Action Plan Update: Greenhouse Gas Reduction Targets and Gap Analysis – Technical Memorandum

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1 INTRODUCTION

This technical memorandum describes the approach used to establish target levels for the reduction of greenhouse gas (GHG) emissions in the County of San Diego (County) Climate Action Plan Update (CAP Update).

2 REGULATORY CONTEXT

The County's GHG reduction targets were developed in the context of the County Board of Supervisors' Framework for the Future, and statewide plans, laws, and executive orders addressing statewide limits on levels of GHG emissions. This regulatory context for the County's GHG reduction targets is described further below.

2.1 FRAMEWORK FOR THE FUTURE

The County Board of Supervisors approved the Framework for the Future, "Actions to Achieve Bold Climate Action at the County of San Diego", on January 13, 2021, which created policy recommendations for the CAP Update, which include achieving at a minimum Senate Bill 32 GHG emissions reductions of 40% below 1990 levels by 2030 and establishing actions to meet a goal of net zero carbon emission by 2035-2045, in line with Executive Order (EO) B-55-18.

2.2 STATE EXECUTIVE ORDERS AND LEGISLATION

The State government has set forth statewide GHG emissions reduction targets through executive orders issued by the Governor and laws adopted by the Legislature. Executive orders and State laws most relevant to the established of GHG reduction targets for the County's CAP Update are described below.

2.2.1 Executive Order S-3-05 (2005)

EO S-3-05 of 2005 established near-, mid-, and long-term goals for reducing statewide GHG emissions to the following levels:

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

2.2.2 California Global Warming Solutions Act of 2006 (Assembly Bill 32, 2006)

Assembly AB 32 (Nunez, 2006) established the EO S-3-05 goal of reducing statewide emissions to 1990 levels by 2020 as State law. It required the California Air Resources Board (CARB) to approve a scoping plan at least every five years for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions by 2020.

2.2.3 California Global Warming Solutions Act of 2006: Emissions Limit (Senate Bill 32, 2016)

Senate Bill (SB) 32 (Pavley, 2016) revised State law to require that CARB, when adopting rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions, ensure that statewide GHG emissions are reduced to at least 40 percent below 1990 levels by 2030. Before being codified into law by SB 32, the goal of reducing statewide GHG emissions to 40 percent below 1990 levels was established by EO B-30-15 in 2015. The text of EO-B-30-15 refers to its 2030 statewide emissions limit as an "interim target" needed to achieve the 2050 emissions target of EO-S-3-05.

2.2.4 Executive Order B-55-18 (2018) to Achieve Carbon Neutrality

EO B-55-18 established a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. It explains that this carbon neutrality goal is in addition to the existing statewide GHG emissions reduction targets.

2.2.5 The California Climate Crisis Act (Assembly Bill 1279, 2022)

AB 1279 (Muratsuchi, 2022) revised State law by making it the policy of the State to do both of the following:

- Achieve net zero GHG emissions as soon as possible, but no later than 2045, and to achieve and maintain net negative emissions thereafter; and
- Ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below 1990 levels as a pathway for meeting the net zero goal.

AB 1279 defines net zero GHG emissions as a condition in which GHG emissions released into the atmosphere are balanced by removals of GHG emissions over a period of time. CARB uses the United States Environmental Protection Agency (USEPA) definition of anthropogenic GHG emissions, which refers to emissions that are a direct result of human activities or are the result of natural processes that have been affected by human activities. A further discussion on the specific activities and GHGs included in this definition can be found on pages ES-8 through ES-16 of the USEPA 2023 *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2021* (USEPA, 2023).

These statewide GHG reduction targets set forth in the California Climate Crisis Act supersede the EO B-55-18 goal to achieve carbon neutrality no later than 2045 with a target of net zero GHG emissions no later than 2045 and expand upon them by requiring that anthropogenic GHG emissions (e.g., emissions associated with burning fossil fuels, waste generation) are reduced to at least 85 percent below 1990 levels by 2045.

AB 1279 requires that statewide emissions be reduced to lower levels (5% lower) and on a faster timeline (5 years sooner) than EO S-03-05, which established a goal of reducing statewide GHG emissions to 80 percent below 1990 levels by 2050. This statute also requires that updates to the scoping plan prepared by CARB achieve the statewide GHG emissions reduction targets set forth in AB 1279.

2.3 2022 SCOPING PLAN FOR ACHIEVING CARBON NEUTRALITY

The 2022 Scoping Plan addresses the AB 1279 emissions limits by identifying a technologically feasible, cost-effective scenario – referred to as the Scoping Plan Scenario – to achieve statewide carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels. It also Identifies a path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030 but concludes that additional reductions are needed by 2030 – to 48 percent below 1990 levels – for the state to stay on track to achieve net zero GHG emissions no later than 2045 pursuant to AB 1279 (CARB 2022a:108; 116). The 2022 Scoping Plan is the first scoping plan to consider natural and working lands (NWL) as part of the State's strategy to reduce GHG emissions through increases in carbon storage.

2.3.1 2022 Scoping Plan Alternatives

The Scoping Plan development process included evaluation of the technological feasibility, cost-effectiveness, and equity-focused pathways for the state to achieve statewide carbon neutrality prior to 2045. In this process of evaluating alternatives, CARB modeled scenarios for economic GHG emission sectors and in four alternatives, including two alternatives for reaching carbon neutrality prior to 2035. The ability for NWL to sequester carbon was also evaluated in four separate alternatives to maximize effectiveness of natural carbon dioxide removal (CDR). Based on this information and a thorough stakeholder engagement process, CARB decided on a preferred "Scoping Plan Scenario" of achieving net zero emissions by 2045. The alternatives evaluated and the preferred Scoping Plan Scenario are discussed further below.

2022 SCOPING PLAN ALTERNATIVES EVALUATING STATEWIDE CARBON NEUTRALITY BY 2035

The draft version of the 2022 Scoping Plan (May 2022) considered two alternative scenarios that would achieve statewide carbon neutrality by 2035 (referred to as Alternatives 1 and 2) (CARB 2022d). Ultimately CARB adopted the final 2022 Scoping Plan using the Scoping Plan Scenario, which identifies a statewide pathway to carbon neutrality by 2045. CARB ultimately concluded that the Scoping Plan Scenario for 2045 carbon neutrality is more cost effective and technologically feasible than the 2035 carbon neutrality alternatives and identified "several feasibility concerns" with 2035 carbon neutrality. CARB performed analysis demonstrating that 2035 carbon neutrality alternatives 1 and 2 would have the following outcomes relative to the 2045 timeline of the Scoping Plan Scenario:

- 5 times and 3 times slower job growth in 2035,
- 7 times and 6 times higher direct costs in 2035, and
- 6 times and 5 times slower economic growth in 2035 (CARB 2022d:44), respectively.

THE SCOPING PLAN SCENARIO

The Scoping Plan Scenario shows that it is economically and technologically feasible to reduce emission to at least 85 percent below 1990 levels by 2045 as called for by AB 1279. It also shows that mitigation of 100% of anthropogenic emissions by 2045 is not economically and technologically feasible and that CDR should be utilized to achieve California's carbon neutrality target. In addition, the Scoping Plan Scenario shows that natural and working lands are projected to be a net emissions source of approximately 7 million metric tons of carbon dioxide equivalent per year (MMTCO2e/year) in 2030 and 2045 (CARB 2022a:91), even with actions to preserve carbon storage potential. As a result, the Scoping Plan Scenario compensates for residual anthropogenic emissions and net emissions from natural working lands with additional CDR strategies, including mechanical direct air capture.

The actions included in the Scoping Plan Scenario to reduce anthropogenic emissions and manage carbon stocks in natural and working lands to achieve statewide net zero emissions by 2045 are summarized in Table 1. The table shows the types of technologies and energy needed to drastically reduce anthropogenic GHG emissions. It also includes references to relevant statutes and Executive Orders, although it is not comprehensive of all existing new authorities for directing or supporting the actions described. The following actions of the Scoping Plan Scenario achieve the AB 1279 target of 85 percent below 1990 levels by 2045 and identify a need to accelerate the 2030 target to 48 percent below 1990 levels.

Table 1. Scoping Plan Scenario Actions to Reduce Anthropogenic Emissions and Manage Carbon Stocks in Natural and Working Lands

Sector	Actions Included in the Scoping Plan Scenario
Smart Growth / Vehicle Miles Traveled (VMT)	VMT per capita reduced 25% below 2019 levels by 2030, and 30% below 2019 levels by 2045
Light-duty Vehicle (LDV) Zero Emission Vehicles (ZEVs)	100% of LDV sales are ZEV by 2035
Truck ZEVs	100% of medium-duty (MDV)/HDV sales are ZEV by 2040 (AB 74 University of California Institute of Transportation Studies [ITS] report)
Aviation	20% of aviation fuel demand is met by electricity (batteries) or hydrogen (fuel cells) in 2045. Sustainable aviation fuel meets most or the rest of the aviation fuel demand that has not already transitioned to hydrogen or batteries.
Ocean-going Vessels (OGV)	2020 OGV At-Berth regulation fully implemented, with most OGVs utilizing shore power by 2027. 25% of OGVs utilize hydrogen fuel cell electric technology by 2045.
Port Operations	100% of cargo handling equipment is zero-emission by 2037. 100% of drayage trucks are zero emission by 2035.
Freight and Passenger Rail	100% of passenger and other locomotive sales are ZEV by 2030. 100% of line haul locomotive sales are ZEV by 2035. Line haul and passenger rail rely primarily on hydrogen fuel cell technology, and others primarily utilize electricity.
Oil and Gas Extraction	Reduce oil and gas extraction operations in line with petroleum demand by 2045.
Petroleum Refining	CCS on majority of operations by 2030, beginning in 2028 Production reduced in line with petroleum demand.
Electricity Generation	Sector GHG target of 38 million metric tons of carbon dioxide equivalent ($MMTCO_2e$) in 2030 and 30 $MMTCO_2e$ in 2035 Retail sales load coverage 20 gigawatts (GW) of offshore wind by 2045 Meet increased demand for electrification without new fossil gas-fired resources.
New Residential and Commercial Buildings	All electric appliances beginning 2026 (residential) and 2029 (commercial), contributing to 6 million heat pumps installed statewide by 2030
Existing Residential Buildings	80% of appliance sales are electric by 2030 and 100% of appliance sales are electric by 2035. Appliances are replaced at end of life such that by 2030 there are 3 million all-electric and electric-ready homes—and by 2035, 7 million homes—as well as contributing to 6 million heat pumps installed statewide by 2030.
Existing Commercial Buildings	80% of appliance sales are electric by 2030, and 100% of appliance sales are electric by 2045. Appliances are replaced at end of life, contributing to 6 million heat pumps installed statewide by 2030.
Food Products	7.5% of energy demand electrified directly and/or indirectly by 2030; 75% by 2045
Construction Equipment	25% of energy demand electrified by 2030 and 75% electrified by 2045
Chemicals and Allied Products; Pulp and Paper	Electrify 0% of boilers by 2030 and 100% of boilers by 2045. Hydrogen for 25% of process heat by 2035 and 100% by 2045 Electrify 100% of other energy demand by 2045.
Stone, Clay, Glass, and Cement	CCS on 40% of operations by 2035 and on all facilities by 2045 Process emissions reduced through alternative materials and CCS

Sector	Actions Included in the Scoping Plan Scenario
Other Industrial Manufacturing	0% energy demand electrified by 2030 and 50% by 2045
Combined Heat and Power	Facilities retire by 2040.
Agriculture Energy Use	25% energy demand electrified by 2030 and 75% by 2045
Low Carbon Fuels for Transportation	Biomass supply is used to produce conventional and advanced biofuels, as well as hydrogen.
Low Carbon Fuels for Buildings and Industry	In 2030s biomethane135 blended in pipeline Renewable hydrogen blended in fossil gas pipeline at 7% energy (~20% by volume), ramping up between 2030 and 2040 In 2030s, dedicated hydrogen pipelines constructed to serve certain industrial clusters
Non-combustion Methane Emissions	Non-combustion Methane Emissions
High GWP Potential Emissions	Low GWP refrigerants introduced as building electrification increases, mitigating HFC emissions
Natural and Working Lands	
Natural and Working Lands	Conserve 30% of the state's NWL and coastal waters by 2030. Implement near- and long-term actions to accelerate natural removal of carbon and build climate resilience in our forests, wetlands, urban greenspaces, agricultural soils, and land conservation activities in ways that serve all communities—and in particular low-income, disadvantaged, and vulnerable communities.
Forests and Shrublands	At least 2.3 million acres treated statewide annually in forests, shrublands/chaparral, and grasslands, comprised of regionally specific management strategies that include prescribed fire, thinning, harvesting, and other management actions. No land conversion of forests, shrublands/chaparral, or grasslands.
Grasslands	At least 2.3 million acres treated includes increased management of grasslands interspersed in forests to reduce fuels surrounding communities using management strategies appropriate for grasslands. No land conversion of forests, shrublands/chaparral, or grasslands.
Croplands	Implement climate smart practices for annual and perennial crops on ~80,000 acres annually. Land easements/ conservation on annual crops at ~5,500 acres annually. Increase organic agriculture to 20% of all cultivated acres by 2045 (~65,000 acres annually).
Developed Lands	Increase urban forestry investment by 200% above current levels and utilize tree watering that is 30% less sensitive to drought. Establish defensible space that accounts for property boundaries.
Wetlands	Restore 60,000 acres of Delta wetlands.
Sparsely Vegetated Lands	Land conversion at 50% of the Reference Scenario land conversion rate.

Source: CARB 2022a

Even with implementation of the above actions, the Scoping Plan Scenario shows that anthropogenic emissions will continue to be emitted and NWL will continue to serve as a net source of emissions; the Scoping Plan Scenario is estimated to result in additional NWL emissions of 7 MMTCO2e/year from 2025-2045. The Scoping Plan Scenario aims to close the remaining emissions gap to reaching net zero emissions through the deployment of mechanical CDR technologies, such as direct air capture.

The 2022 Scoping Plan reports statewide GHG emissions under implementation of the above Scoping Plan Scenario actions for eight economic sectors: agriculture, residential and commercial, electric power, high global warming potential (GWP) gases, industrial, recycling and waste, transportation, and carbon dioxide removal (CARB 2022a).

Statewide emissions in 2030 and 2045 under implementation of the Scoping Plan Scenario, as well as assumptions for emissions removed from the atmosphere due to mechanical CDR strategies, are provided in Table 2 (CARB 2022b, CARB 2022c). Statewide emissions under the Scoping Plan Scenario would be -10.2 MMTCO2e/year because emissions removed from the atmosphere through CDR Strategies (-74.99 MMTCO2e/year) would exceed emissions from Agriculture, Residential and Commercial, Electric Power, High Global Warming Potential (GWP), Industrial, Recycling and Waste, and Transportation (64.79 MMTCO2e/year).

Table 2. Emissions Reductions by Sector under the Scoping Plan Scenario

Sectors	CARB's Statewide GHG Inventory (MMTCO2e/yr)	2022 Scoping Plan Scenario (MMTCO2e/yr)			
	2019	2030	2035	2040	2045
Agriculture	31.40	20.10	18.34	16.56	15.30
Residential and Commercial	40.50	26.82	17.77	9.70	4.40
Electric Power	60.20	39.20	31.11	27.92	8.68
High Global Warming Potential (GWP)	20.70	9.90	9.80	9.70	9.00
Industrial	80.40	40.55	29.14	18.50	11.52
Recycling and Waste	8.80	9.18	8.72	8.34	7.99
Transportation	162.40	80.58	53.06	26.71	7.94
Carbon Dioxide Removal (CDR) (including NWL carbon sequestration, DAC, and BECCS)	0.00	-6.77	-35.11	-62.90	-74.99
Total	**404.4**	**219.6**	**132.8**	**54.5**	**-10.2**

Sources: CARB 2022a, CARB 2022b, CARB 2022c.

Notes: MMTCO2e/yr = million metric tons carbon dioxide equivalent per year; NWL = natural and working lands; DAC = direct air capture; BECCS = bioenergy with carbon capture and storage.

3 ESTABLISHING TARGETS FOR THE CAP UPDATE

The target setting process for the CAP Update involves identifying the State laws and plans with the best available information on the timing and levels of GHG emissions reductions needed to address climate change, and then calculate specific emissions levels and reduction percentages for the unincorporated area that are in alignment with the statewide levels and percentages.

3.1 ALIGNING WITH STATEWIDE TARGETS AND THE FRAMEWORK FOR THE FUTURE

The first step in the target-setting process is to identify the relevant State laws and plans with which the CAP Update's GHG reductions should be in alignment. The CAP Update's GHG reduction targets and goals are informed by the following State plans and laws, as well as the County's Framework for the Future:

- Reducing emissions to 48 percent below 1990 levels by 2030 (per the 2022 Scoping Plan),
- Reducing emissions to 85 percent below 1990 levels by 2045 (per AB 1279),
- Achieving net zero emissions no later than 2045 (per AB 1279),
- Achieving net zero carbon emissions by 2035-2045 (per the County's Framework for the Future).

3.1.1 Basis for the 2030 GHG Reduction Target

For 2030, the CAP Update's target is aligned with the 2022 Scoping Plan, which concludes that statewide GHG emissions levels need to be reduced to 48 percent below 1990 levels by 2030 for the state to stay on track to achieve net zero GHG emissions no later than 2045 (as required by AB 1279). This is a steeper reduction than set forth in SB 32, which establishes a statutory limit of reducing statewide emissions to 40 percent below 1990 levels by 2030.

The County's Framework for the Future calls on the CAP Update to achieve at a minimum the SB 32 GHG emissions reductions of 40 percent below 1990 levels by 2030, and to meet a goal of net zero carbon emissions by 2035-2045. To put the County on a path to achieve net zero emissions in alignment with the 2022 Scoping Plan, AB 1279, and the Framework for the Future, the CAP Update's 2030 target is developed in alignment with the steeper reductions of 48 percent below 1990 levels shown in the 2022 Scoping Plan.

3.1.2 Basis for the 2045 GHG Reduction Target

For 2045, the CAP Update's target is aligned with AB 1279, which requires that the State's target of net zero emissions by 2045 include reducing statewide anthropogenic emissions by at minimum 85 percent below 1990 levels by 2045. Anthropogenic emissions include the primary sources and activities within the County's GHG emissions categories: On-road Transportation, Electricity, Natural Gas, Waste, Agriculture, Propane, Off-road Transportation, Water, and Wastewater. To go beyond an 85 percent anthropogenic emissions reduction and achieve statewide net zero emissions by 2045, the 2022 Scoping Plan relies on large-scale deployment of CCS technologies and mechanical CDR strategies like direct air capture machines. The County government does not have the jurisdiction or other ability to construct and operate CCS and mechanical CDR strategies at the pace and scale needed to achieve net zero emissions by 2045. The 2022 Scoping Plan also assumes that additional reduction in anthropogenic emissions beyond 85% by 2045 would not be cost-effective or technologically feasible. As a result, the CAP Update's 2045 target is aligned with the AB 1279 target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045.

3.1.3 Basis for the 2045 Aspirational Goal

The CAP Update also includes an aspirational goal to achieve net zero carbon emissions by 2045, consistent with the Framework for the Future. This goal is in addition to the 2045 target aligned with reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. By including an aspirational goal for net zero carbon emissions in the CAP Update, the County can demonstrate how it is going above and beyond reductions in anthropogenic emissions and working towards net zero emissions in the unincorporated area, for example through measures to increase carbon stored in natural and working (e.g., agricultural) lands, and actions that put the County on a path to net zero. The 2022 Scoping Plan concluded that achieving net zero emissions statewide by 2045 is cost effective and technologically feasible. Because the draft 2022 Scoping Plan demonstrates that 2035 carbon neutrality is not cost-effective or technologically feasible, the CAP Update aspirational goal to achieve net zero carbon emission is set for 2045.

3.2 DEVELOPING EMISSIONS REDUCTION LEVELS AND TARGET PERCENTAGES SPECIFIC TO THE UNINCORPORATED AREA

To develop community-specific target percentages for the CAP Update that align with statewide targets, the 2022 Scoping Plan was reviewed to identify the emissions sectors in this statewide plan that are relevant and applicable to the County of San Diego. The emissions reduction trajectory of each applicable sector in the 2022 Scoping Plan is then applied to the County's emissions levels to calculate reduction levels and target percentages for the CAP Update. The analysis performed to derive County-specific GHG reduction targets from State targets and applicable statewide sectors is provided in Appendix 7 to the CAP Update.

3.2.1 Statewide Sectors Applicable to the Unincorporated Area

Review of the 2022 Scoping Plan demonstrates that the County has direct or indirect jurisdiction over activities that generate emissions and contribute to reductions in six of the eight emissions sectors included in the statewide emissions inventory: agriculture, residential and commercial, electric power, industrial, recycling and waste, and transportation. This review is summarized in Table 3.

Table 3. 2022 Scoping Plan Emissions Sectors Applicable to the County of San Diego

Emissions Sectors – 2022 Scoping Plan	Applicable to County of San Diego?
Agriculture	Yes
Residential and Commercial	Yes
Electric Power	Yes
High Global Warming Potential (GWP)	No
Industrial	Yes
Recycling and Waste	Yes
Transportation	Yes
Carbon Dioxide Removal (CDR)	No

Source: Ascent 2023.

The high global warming potential (GWP) gases and carbon dioxide removal (CDR) sectors are excluded for the following reasons. First, the County has limited to no ability to control or influence emissions of high GWP gases because it has limited or no jurisdiction or influence over the following activities in the unincorporated area: substitution of ozone-depleting substances with high GWP gas substitutes; emissions of sulfur hexafluoride (SF_6) from electricity transmission lines; and semiconductor manufacturing processes. Second, the state's CDR sector identifies significant reductions from engineered strategies to remove significant levels of emissions from the atmosphere using technologies like direct air capture and carbon capture and storage (CCS). Constructing and operating direct air capture machines to remove GHG emissions from the atmosphere is outside the scope of local governments in California, including the County. In addition, the unincorporated area does not include large-scale petroleum refineries, GHG-emitting electric power plants, cement manufacturing facilities, or other large-scale industrial facilities that could have their GHG emissions reduced using CCS technologies.

By excluding these sectors under this approach, community GHG reduction targets for the County can be established in proportion with statewide reductions for all sectors relevant to County jurisdiction to the extent feasible using available data. This target setting approach is consistent with the California Supreme Court decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (2015) 62 Cal.4th 204*, which determined that the approach of assessing a project's consistency with statewide emissions reduction goals must include a "reasoned explanation based on substantial evidence" that links the project's emissions (in this case, the project is the CAP, which covers communitywide emission) to statewide GHG reduction goals.

3.2.2 Target Emissions Reductions Levels and Percentages for the Unincorporated Area

The next step is to translate the statewide target percentages to the unincorporated area. The analysis uses 2019 data from the State's emission inventory and future emissions reductions in 2030, 2035, 2040, and 2045 from the 2022 Scoping Plan (CARB 2022b and 2022c). The future emissions in the 2022 Scoping Plan are 48 percent below statewide 1990 levels in 2030 and 85 percent below 1990 levels in 2045.

Statewide emissions in future years from the applicable sectors are compared to 2019 statewide emissions from applicable sectors to determine the percentage reduction for the unincorporated area. Data for 2019 are used because 1990 emissions data are not available for the unincorporated county and because 2019 is the baseline year of the GHG emissions inventory prepared for the County's CAP. This analysis is summarized in Table 4.

Table 4. Application of Statewide Emissions Reductions by Sector to Applicable County Sectors

Year	All Statewide Sectors		Statewide Sectors Applicable to County of San Diego	
	Statewide Emissions (2019 Inventory and 2022 Scoping Plan Scenario) ($MMTCO_2e$)	Percent Below 2019 levels	Statewide Emissions (2019 Inventory and 2022 Scoping Plan Scenario) ($MMTCO_2e$)	Percent Below 2019 levels
2019	404.40	n/a	384	n/a
2030	219.56	46%	216	43.6%
2035	132.83	67%	158	58.8%
2040	54.53	87%	108	71.9%
2045	-10.16	103%	56	85.4%

Notes:
$MMTCO_2e$ = million metric tons of carbon dioxide equivalent
Source: Ascent 2023.

Table 5 shows the GHG emissions reduction targets for the CAP Update, including the percentage reduction from 2019 levels (CAP GHG Reduction Target), the emissions levels needed to meet the reduction target (Target Emissions Levels), and the amount of GHG reductions needed to achieve the target (Reductions from GHG Emissions Forecast Needed to Achieve Target).

Table 5. County of San Diego Target Emissions and Target Percent Reduction from 2019 Emissions Levels

Year	CAP GHG Reduction Target (relative to 2019 levels)	Target Emissions Levels (MTCO2e/yr)	Reductions from GHG Emissions Forecast Needed to Achieve Target (MTCO2e/yr)
2019	--	2,984,000	--
2030	43.6%	1,683,156	713,844
2035	58.8%	1,229,840	717,160
2040	71.9%	837,806	855,194
2045	85.4%	434,185	1,243,815
2045	Net zero emissions	0 (net)	1,678,000

Notes:
$MTCO_2e/yr$ = metric tons of carbon dioxide equivalent per year
Source: Ascent 2023.

4 ANALYSIS OF CAP TARGETS ATTAINMENT

Comparing the County's projected GHG emissions levels (from the community and County operations) with the CAP Reduction Targets demonstrates that additional emissions reductions are needed for the County to achieve its targets (Table 6). To meet the 2030 CAP Reduction Target, annual GHG emissions would need to be 713,844 $MTCO_2e$ lower than projected 2030 levels. To meet the 2045 CAP Reduction Target, annual GHG emissions would need to be 1,243,815 $MTCO_2e$ lower than projected 2045 levels. To meet the CAP's Aspirational Goal of net zero emissions in 2045, annual GHG emissions would need to be 1,678,000 lower than projected 2045 levels.

Table 6. Comparison of GHG Emissions Projections to CAP Reduction Targets

Emissions Category	GHG Emissions ($MTCO_2e$)				
	2019	**2030**	**2035**	**2040**	**2045**
On-road Transportation	1,331,000	1,033,000	756,000	513,000	512,000
Electricity	599,000	202,000	38,000	20,000	0
Natural Gas	478,000	540,000	561,000	579,000	597,000
Solid Waste	193,000	219,000	206,000	194,000	184,000
Agriculture	134,000	127,000	124,000	122,000	120,000
Propane	121,000	127,000	129,000	131,000	132,000
Off-road Transportation	71,000	99,000	106,000	110,000	114,000
Water	39,000	31,000	8,000	4,000	0
Wastewater	18,000	19,000	19,000	19,000	19,000
Total Emissions	**2,984,000**	**2,397,000**	**1,947,000**	**1,693,000**	**1,678,000**
Percent Reduction from 2019 levels under GHG Emissions Projections		-19.7%	-34.8%	-43.3%	-43.8%
CAP Targets (percent reduction from 2019 levels)		-43.6%	-58.8%	-71.9%	-85.4%
CAP Targets ($MTCO_2e$)		1,683,156	1,229,840	837,806	434,185
Reductions from 2019 levels to meet CAP Targets ($MTCO_2e$)		1,300,844	1,754,160	2,146,194	2,549,815
Reductions from GHG Emissions Projections to meet CAP Targets ($MTCO_2e$)		713,844	717,160	855,194	1,243,815

Source: Ascent 2023.

4.1 ACHIEVING THE CAP REDUCTION TARGETS

The CAP establishes nine strategies, 21 measures, and 70 actions that the County will take to achieve the 2030 and 2045 targets and make progress towards the net zero emissions goal. These actions reduce GHG emissions from five emissions reduction sectors through:

- **Built Environment and Transportation:** Increased mobility options and transitions to efficient and zero-emission vehicles and equipment
- **Energy:** Increased energy efficiency, electrification, and renewable energy use in buildings
- **Solid Waste:** Increased waste diversion and improved waste management practices
- **Water and Wastewater:** Increased water efficiency, recycling, and reuse to reduce potable water consumption
- **Agriculture and Conservation:** Increased preservation and restoration of natural and working lands and transitions to efficient and zero-emission agricultural equipment

Strategies describe the measures and actions within each sector and how they will help achieve the County's vision for net zero within each sector. Measures describe the County's policy goals and include actions that outline the steps the County will carry out to achieve quantified GHG reductions that contribute towards the 2030 and 2045 targets and put the County on a path to reaching the net zero emissions goal. Quantified GHG reductions are achieved through implementing actions outlined under each measure.

Two types of implementing actions are quantified: (1) actions that reduce GHG emissions from anthropogenic or human-caused activities, such as consuming fossil fuels like gasoline, diesel, and natural gas, using electricity generated from fossil fuels, and generating and disposing of organic waste in landfills; and (2) carbon storage actions that remove emissions from the atmosphere and store them in soil and vegetation. Each of the five emissions reductions sectors include quantified actions to reduce anthropogenic emissions, while the Agriculture and Conservation sector also includes reductions from carbon storage actions.

As shown in Table 7, the CAP reduction targets for 2030 and 2045 would be achieved by the implementing actions that reduce anthropogenic GHG emissions; carbon storage actions that remove emissions from the atmosphere are counted separately for their contribution towards the County's Aspirational Goal of net zero emissions by 2045. The relative contribution of actions within each emissions reduction sector to achieving the CAP reduction target for 2030 is shown in Figure 1.

Table 7. Analysis of CAP Target Achievement with CAP Strategies, Measures, and Actions to Reduce Anthropogenic GHG Emissions

Strategies, Measures, Actions to Reduce Anthropogenic GHG Emissions	Annual GHG Emissions Reductions ($MTCO_2e$/year)	
	2030	2045
Built Environment and Transportation		
Strategy: Decarbonize the On-Road and Off-Road Vehicle Fleet	**236,498**	**396,815**
Measure T-1: Reduce fleet and small equipment emissions from County Operations		
Action T-1.1 Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045.	*7,900*	*13,250*
Action T-1.2 Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.	*5*	*5*
Measure T-2: Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area		
Action T-2.1 Develop a program by 2026 to provide residents and businesses incentives to purchase alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 3% by 2030.	*2,072*	-
Action T-2.2 Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.	*7,638*	*86,376*
Measure T-3: Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area		
Action T-3.1 Increase the use of electric and other zero-emission vehicles in the unincorporated area by: ▶ *Installing 2,040 publicly available electric vehicle charging stations by 2028.* ▶ *Requiring the electrification of loading docks and idling reduction in new commercial and industrial development by 2030.* ▶ *Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multi-family residential and non-residential construction.* ▶ *Developing a program to incentivize EV purchases and school bus electrification*	*218,884*	*297,184*
Strategy: Support Active Transportation and Reduce Single-Occupancy Vehicle Trips	**32,333**	**51,926**
Measure T-4: Reduce emissions from County employee commutes		
Action T-4.1 Expand County Benefit Program to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time teleworking options to reduce vehicle miles traveled from employee commutes by 40% in 2030 and 64% in 2045.	*12,800*	*8,960*
Action T-4.2 Develop a rebate program for County employees to purchase electric vehicles, bicycles, and scooters for commute use.	*903*	*1,448*
Measure T-5: Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency		
Action T-5.1 Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the unincorporated area.	*1,756*	*2,800*
Action T-5.2 Develop a countywide Safe Routes to Schools program to reduce vehicle miles traveled to schools by 1.2% by 2030.	*214*	*82*
Measure T-6: Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area		
Action T-6.1 Develop a program to provide free transit passes and/or free trips in the unincorporated area to reduce vehicle miles traveled in the unincorporated area by 1.2% by 2030.	*3,051*	*2,146*
Action T-6.2 Increase access to Transit Priority Areas by 5% in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians by 2030.	*12,615*	*35,198*
Action T-6.3 Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) to reduce vehicle miles traveled by 7% within the unincorporated area by 2030.	*994*	*1,292*

Strategies, Measures, Actions to Reduce Anthropogenic GHG Emissions	Annual GHG Emissions Reductions ($MTCO_2e$/year) 2030	Annual GHG Emissions Reductions ($MTCO_2e$/year) 2045
Energy		
Strategy: Increase Building Energy Efficiency, Renewable Energy, and Electrification in the Unincorporated Area and County Operations	**333,097**	**536,299**
Measure E-1: Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations		
Action E-1.1 Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.	*13,715*	*16,858*
Measure E-2: Develop policies and programs to increase energy efficiency and electrification in the unincorporated area		
Action E-2.1 Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.	*17,734*	*80,358*
Action E-2.2 Increase energy efficiency and reach 30% electrification in residential and 17% electrification in non-residential existing development in the unincorporated area by 2030 by: ▸ *Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar energy efficiency requirements for existing development projects with qualifying improvements.* ▸ *Adopting a Building Energy Performance Standard by 2026 for commercial and multi-family residential properties.* ▸ *Developing a program by 2026 to incentivize building electrification and energy efficiency.*	*124,742*	*439,082*
Measure E-3: Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area		
Action E-3.1 Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.	*252*	*0*
Action E-3.2 Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.	*29*	*0*
Action E-3.3 Develop a program to provide 100% renewable energy to residents and businesses participating in San Diego Community Power by 2030 in the unincorporated area.	*176,625*	*0*
Solid Waste		
Strategy: Increase Solid Waste Diversion in the Unincorporated Area and County Operations	**38,852**	**59,351**
Measure SW-1: Achieve zero waste in County operations		
Action SW-1.1 Adopt a County Operations zero waste policy by 2030 to achieve zero waste (90% diversion).	*1,048*	*1,571*
Measure SW-2: Achieve zero waste within the unincorporated area		
Action SW-2.1 Update the County's Strategic Plan to Reduce Waste by 2028 to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.	*37,804*	*57,779*
Strategy: Increase Availability of Sustainable Solid Waste Facilities in the Unincorporated Area and County Operations	**1,373**	**69,448**
Measure SW-3: Improve waste management practices at County-owned solid waste facilities to reduce emissions		
Action SW-3.1 Expand landfill gas systems at County-owned landfills to exceed State requirements by 10% by 2045.	*0*	*9,283*
Measure SW-4: Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion		
Action SW-4.1 Conduct a feasibility study by 2027 and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% by 2045 in the incorporated area.	*1,373*	*60,164*

Strategies, Measures, Actions to Reduce Anthropogenic GHG Emissions		Annual GHG Emissions Reductions ($MTCO_2e$/year)	
		2030	2045
Water and Wastewater			
Strategy: Decrease Potable Water Consumption in the Unincorporated Area and County Operations		**445**	**0**
Measure W-1: Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations			
Action W-1.1 Implement the County's Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.		*3*	*0*
Measure W-2: Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area			
Action W-2.1 Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 17% in the unincorporated area.		*37*	*0*
Action W-2.2 Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements for existing development projects with qualifying improvements.		*320*	*0*
Action W-2.3 Update the Green Building Incentive program by 2026 to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.		*64*	*0*
Action W-2.4 Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.		*21*	*0*
Strategy: Increase Stormwater Collection, Water Pumping, and Wastewater Treatment Efficiency		**10,046**	**1,869**
Measure W-3: Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use in the unincorporated area			
Action W-3.1 Increase wastewater treatment efficiency through the East County Advanced Water Purification Program to produce 12,900 acre feet of water each year by 2030.		*10,046*	*1,869*
Agriculture and Conservation			
Strategy: Preserve Natural Lands and Improve Land Management Practices to Protect Habitat and Increase Carbon Storage		**63,242**	**91,218**
Measure A-1: Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential in the unincorporated area			
Action A-1.1 Acquire 11,000 acres of conservation lands by 2030 and 1,000 acres per year thereafter to preserve land in perpetuity.		*63,242*	*91,218*
Strategy: Support Climate-Friendly Farming Practices and Preserve Agricultural Land		**11,258**	**36,965**
Measure A-3: Preserve agricultural lands to prioritize carbon storage and balance economic and development goals			
Action A-3.1 Implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 6,058 acres of agricultural land by 2030 and 400 acres per year thereafter.		*9,699*	*17,327*
Measure A-5: Reduce greenhouse gas emissions from agricultural operations			
Action A-5.1 Develop a program to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.		*1,559*	*19,638*
CAP Strategies	Total Annual Reductions ($MTCO_2e$/year)	727,142	1,243,891
	Percent Reduction (from 2019 levels)	-44.0%	-85.5%
CAP Targets	Total Annual Reductions Needed ($MTCO_2e$/year)	713,844	1,243,815
	Percent Reduction Needed (from 2019 levels)	-43.6%	-85.4%
	CAP Target Achieved?	Yes	Yes

Source: Ascent 2023.

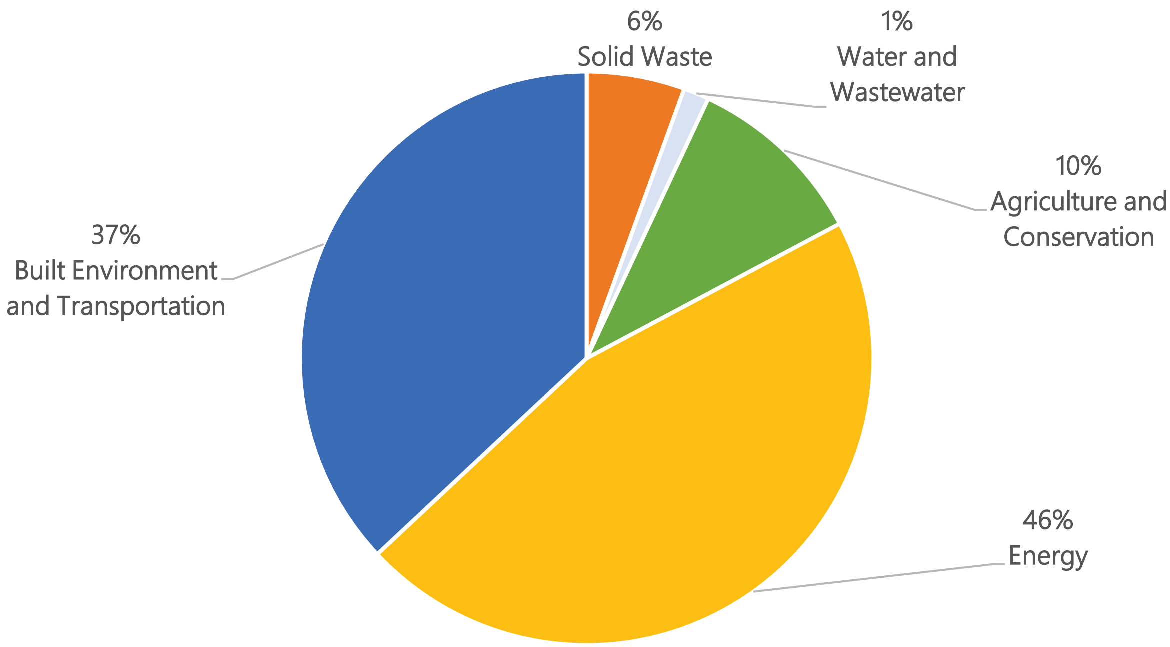

Figure 1. Relative Contribution of Actions within Each Emissions Sector to Achieving the 2030 CAP Reduction Target

Table 8 shows annual emissions that would be removed from the atmosphere by the four quantified implementing actions that increase carbon storage. These actions would increase the amount of carbon stored in soils and vegetation in the unincorporated area through habitat restoration, tree-planting, and carbon farming.

Table 8. GHG Emissions Removed from the Atmosphere by Carbon Storage Strategies, Measures, Actions

Carbon Storage Strategies, Measures, Actions to Remove Emissions from the Atmosphere	Annual GHG Emissions Removed from Atmosphere ($MTCO_2e$/year)	
	2030	2045
Agriculture and Conservation		
Strategy: Preserve Natural Lands and Improve Land Management Practices to Protect Habitat and Increase Carbon Storage	3,013	8,000
Measure A-1: Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential in the unincorporated area		
Action A-1.2 Develop a Habitat Restoration Resource Management Framework for County-owned land and restore 480 acres by 2030 and 80 acres per year thereafter to increase carbon storage.	*76*	*1,223*
Measure A-2: Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities		
Action A-2.1 Expand the County's existing tree planting initiative and implement an Equity Driven Tree Planting Program to plant 70,560 trees by 2030 and 6,650 trees per year thereafter on County property and in the unincorporated area.	*2,498*	*6,029*
Action A-2.2 Implement the County's Landscaping Ordinance to require tree planting in new single family residential development in the unincorporated area.	*439*	*747*
Strategy: Support Climate-Friendly Farming Practices and Preserve Agricultural Land	10,758	121,556
Measure A-4: Incentivize carbon farming to expand carbon storage capacity on agricultural land and support climate-friendly farming practices in the unincorporated area		
Action A-4.1 Develop a Carbon Farming Program by 2026 to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.	*10,758*	*121,556*
Total Carbon Storage	13,771	129,556

Source: Ascent 2023.

As shown in Table 9, the annual removal of 13,771 $MTCO_2e$ from the atmosphere by 2030 and 129,556 $MTCO_2e$ by 2045 by the carbon storage actions would result in the County further exceeding its CAP reduction targets for 2030 and 2045 and making substantial progress towards its aspirational goal of achieving net zero emissions by 2045. The carbon storage actions would reduce annual emissions levels in 2030 from 44.0% to 44.5% below 2019 levels and reduce annual emissions levels in 2045 from 85.5% to 89.8% below 2019. To achieve net zero emissions the County would need to reduce or store an additional 1,656,086 $MTCO_2e$ by 2030 and an additional 304,553 $MTCO_2e$ by 2045.

Table 9. Summary of CAP Targets Achievement and Progress toward Aspirational Goal with Anthropogenic GHG Emissions Reductions and Carbon Storage

	Annual GHG Emissions ($MTCO_2e$)	
	2030	2045
Total GHG Emissions with Anthropogenic GHG Emissions Reductions	**1,669,858**	**434,109**
Percent reduction below 2019 levels	-44.0%	-85.5%
CAP Targets Achieved?	Yes	Yes
GHG Emissions Removed By Carbon Storage	**13,771**	**129,556**
Total GHG Emissions with Anthropogenic GHG Emissions Reductions and Carbon Storage Measures	**1,656,086**	**304,553**
Percent reduction below 2019 levels with anthropogenic GHG emissions reduction and carbon storage measures	-44.5%	-89.8%
Additional Reductions/Storage Needed to meet Aspirational Goal: Net Zero ($MTCO_2e$)	**1,656,086**	**304,553**

Source: Ascent 2023.

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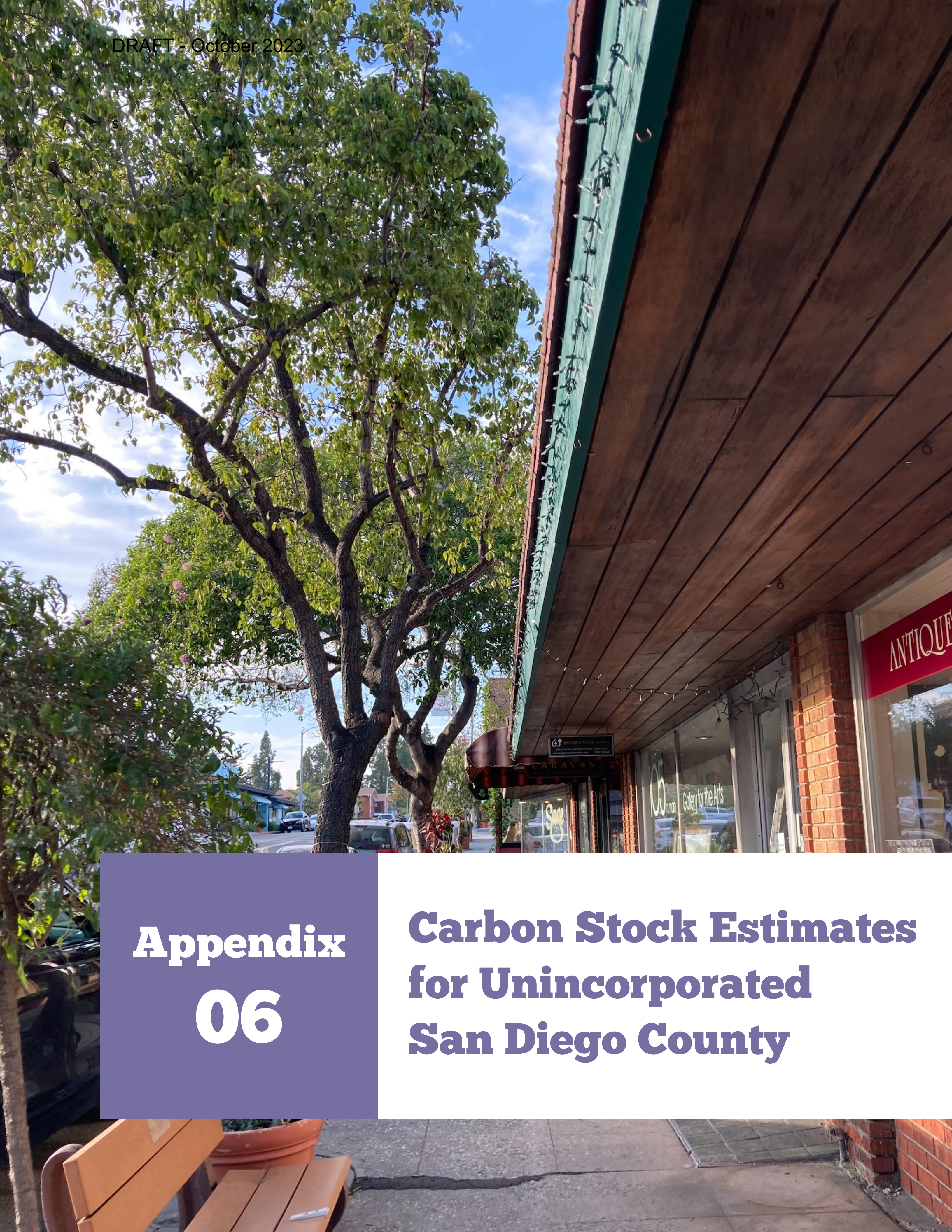

Appendix 06

Carbon Stock Estimates for Unincorporated San Diego County

Memo

1230 Columbia Street, Suite 440
San Diego, CA 92101
619.219.8000

Date: October 10, 2023

To: Meghan Kelly, County of San Diego

From: Liz Luck, Hannah Kornfeld, Andrew Martin, Poonam Boparai, Fred Hochberg (Ascent)

Subject: **Carbon Stock Estimates for Unincorporated San Diego County**

This technical memorandum presents an estimate of existing carbon stock in unincorporated San Diego County (unincorporated county) in 2016. The estimates account for carbon stored in vegetation and soils on natural (e.g., grasslands, forests) and working (i.e., agricultural) lands within the unincorporated county, but excludes tribal lands and Marine Corps Base Camp Pendleton because the County of San Diego does not have jurisdiction over these areas (the study area is hereinafter referred to as "unincorporated county"). The estimates of carbon stock are calculated based on carbon stock changes between 2001 and 2016 from the *Carbon Storage and Sequestration Study for San Diego County*[1] prepared by the San Diego Association of Governments (SANDAG) for the entire San Diego region.

As discussed in the Climate Action Plan's Appendix 5, the State of California's 2022 Scoping Plan for Achieving Carbon Neutrality shows that, statewide, natural and working lands are projected to be a net emissions source in 2030 and 2045. Actions that increase carbon storage, such as through improved natural and working (e.g., agricultural) land management practices, contribute to reaching net zero emissions.

This memorandum includes the following sections:

- **Section 1: Overview of Carbon Stock and Sequestration** provides an overview of carbon stock and sequestration and other concepts and key terms referenced in this memo.
- **Section 2: Summary of Estimated Existing Carbon Stock in the Unincorporated County** presents the estimated carbon stock of all land cover types in the unincorporated county in 2016.
- **Section 3: Methods to Estimate Existing Carbon Stock in the Unincorporated County** describes the data, sources, and methodology used to estimate existing carbon stock.

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[1] Available at: https://www.sandag.org/-/media/SANDAG/Documents/PDF/projects-and-programs/environment/climate-resilience-and-adaptation/holistic-adaptation-planning/carbon-storage-and-sequestration-study-san-diego-county-2022-03-01.pdf

1 OVERVIEW OF CARBON STOCK AND SEQUESTRATION

The natural carbon cycle involves the exchange of carbon between the atmosphere and the Earth (land and ocean). As part of the carbon cycle, fire, plant respiration and decomposition are balanced by plant growth and other processes that take place over decades or centuries. When in balance, these biogenic CO_2 emissions from fire and other sources are balanced by CO_2 sequestration in natural and working lands and waters, resulting in relatively minimal change in the total concentration of atmospheric CO_2 that drives climate change. Emissions from fossil-fuel combustion and other anthropogenic activities have accumulated in the atmosphere at an unprecedented pace and contributed to putting the natural carbon cycle out of balance, thereby increasing the greenhouse effect, and causing anthropogenic climate change. This imbalance in Earth's carbon cycle also contributes to a feedback loop for, among other things, natural and working lands in which increasing atmospheric concentrations of emissions result in warmer temperatures, extreme heat events, droughts, and wildfires, which in turn release additional emissions into the atmosphere. In addition to limiting emissions from fossil fuel combustion and other human activities, managing natural and working lands to increase CO2 sequestration is critical to efforts to achieve carbon neutrality, which means balancing all sources of GHG emissions with carbon sinks.

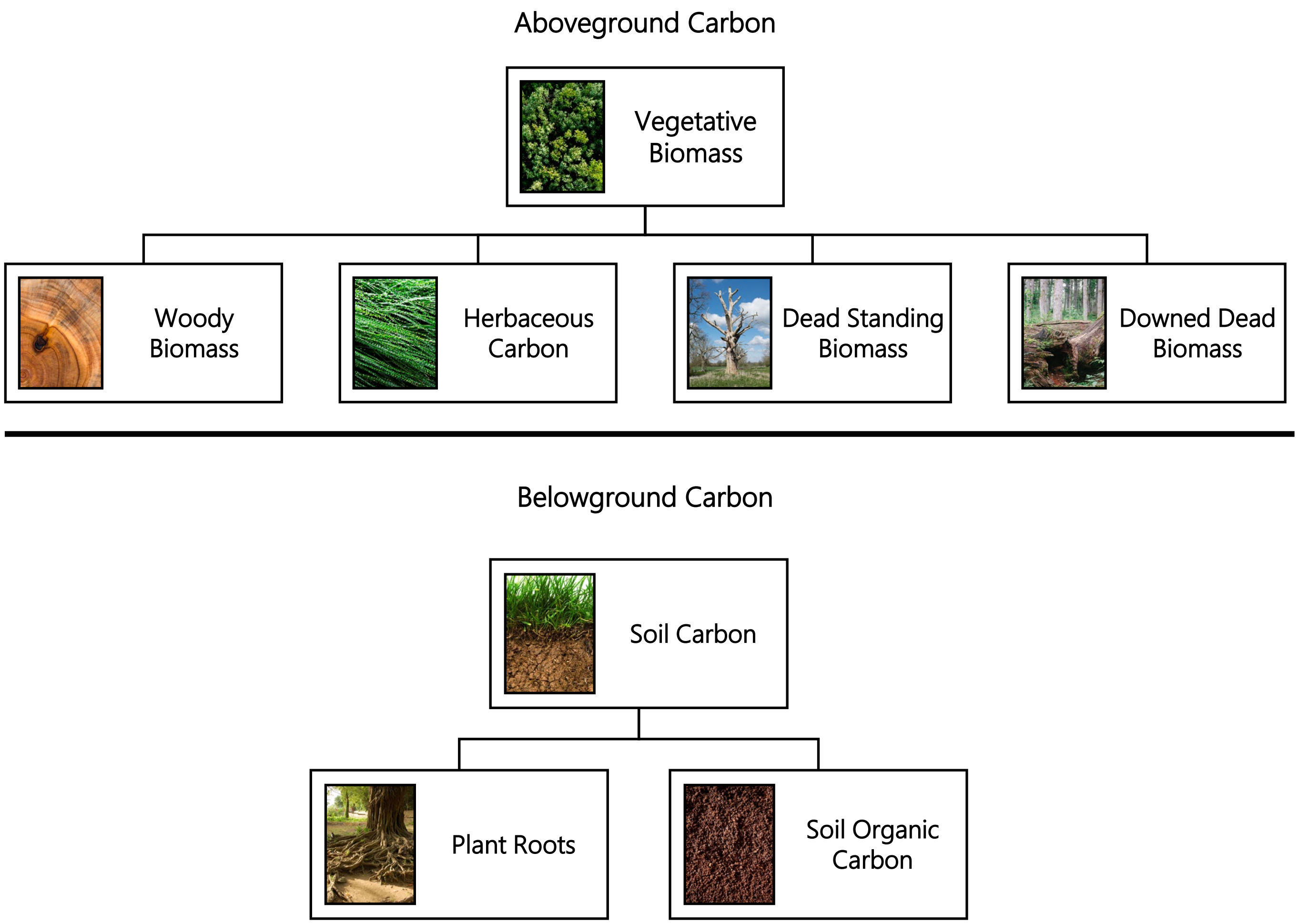
The carbon stock estimates reported in this memo represent the amount of carbon stored in natural lands (e.g., forests, wetlands, grasslands), working lands (e.g., cropland), and other land cover types in 2016. In addition, to estimate carbon stock (amount of carbon) in the unincorporated county, both aboveground and belowground carbon pools (systems that can hold or release carbon) were assessed. The types and sources of carbon that are evaluated in this memo are described below and depicted in Figure 1. References in the remainder of this memo to amounts of carbon stored in land cover types found in the unincorporated county include both aboveground and belowground carbon unless stated otherwise.

1.1 ABOVEGROUND CARBON

Aboveground carbon is the amount of carbon stored within vegetative biomass that is above the soil. Vegetation uses photosynthesis to take carbon dioxide out of the atmosphere and incorporate the carbon into biomass. Aboveground carbon includes woody biomass in trunks, branches, and shoots as well as herbaceous carbon in leaves, flowers, fruiting bodies, and grasses. Additionally, aboveground carbon includes the carbon in leaf litter, dead standing biomass, and downed dead biomass. Approximately 45-50 percent of the dry biomass weight of the vegetation is equivalent to its carbon stock (McGroddy et al. 2004; Schlesinger 1991).

1.2 BELOWGROUND CARBON

Belowground carbon is the carbon stored within plant roots and soil. Plant root carbon stock is estimated the same way as aboveground carbon: estimating biomass by using the dry weight of the materials and converting the biomass to carbon. In soil, carbon is primarily stored as soil organic matter (SOM). SOM is a mixture of carbon compounds consisting of decomposing plant and animal tissue, carbon associated with soil minerals, and microbes. Within SOM, approximately 58 percent is soil organic carbon (SOC), which represents the distinct carbon pool in the soil (Lal 2004). Overall, soil carbon (i.e., organic, and inorganic carbon) constitutes approximately 75 percent of the carbon in terrestrial environments, which is three times the amount stored in living plants and animals. Soils represent a massive sink potential for carbon dioxide from the atmosphere, although soil carbon can either be stored in the soil for millennia or can be quickly released back into the environment due to decomposition. Decomposition of organic matter in the soil by microbial activity can release carbon dioxide as a byproduct, causing the soil to also be a source of atmospheric carbon. The length of time that carbon is stored in soils can be affected by a variety of environmental factors such as vegetation type, climatic conditions, and soil properties such as texture and type. Further, management practices (anthropogenic factors) can affect a soil's potential to be either a source or a sink of carbon. For example, sustainable farming practices such as reduced tillage, cover cropping, and crop rotation can be used to increase soil carbon compared to conventional practices (Ecological Society of America 2000).



Source: Ascent 2023

Figure 1 Aboveground and Belowground Carbon Sources included in Carbon Stock Estimates for the Unincorporated County

1.3 KEY TERMS

The following key terms are used throughout this technical memorandum:

- Carbon Pool: A system which has the capacity to accumulate or release carbon, considered to be a reservoir. Examples include vegetation biomass, soils, and dead and downed vegetation (IPCC 2000).
- Carbon Sequestration: The process of increasing the carbon content of a carbon pool other than the atmosphere (IPCC 2000).
- Carbon Stock: The absolute quantity of carbon (above and/or belowground) held within a pool at a specified time (IPCC 2000).
- Carbon Dioxide Equivalent (CO_2e). The amount of carbon dioxide emissions that would cause the same integrated radiative forcing or temperature change, over a given time horizon, as an emitted amount of a greenhouse gas (GHG) or a mixture of GHGs (IPCC 2018). In addition to carbon dioxide, CO_2e includes the global warming effects of gases such as methane and nitrous oxide, if those gases are present in emissions. It is a standard unit of measure for carbon inventories. All the carbon stock and sequestration data and figures in this memo use CO_2e as the unit of measurement.

- **Sequestration rate:** The rate at which a carbon pool absorbs or releases carbon into the atmosphere, expressed in terms of metric tons of carbon-equivalent per acre per year (MT CO_2e/acre/year). A positive sequestration rate indicates that the carbon pool is absorbing carbon from the atmosphere, and a negative rate indicates that the carbon pool is releasing carbon into the atmosphere.
- **Soil Carbon:** Includes inorganic and organic carbon within soil, constituting 75 percent of terrestrial carbon (Ecological Society of America 2000).
- **Soil Organic Carbon:** The amount of carbon within the organic compounds of soil. Soil organic carbon accounts for 58 percent of soil organic matter (Ecological Society of America 2000).
- **Soil Organic Matter:** A mixture of carbon compounds consisting of decomposing plant and animal tissue and carbon associated with soil minerals and microbes (Ecological Society of America 2000).
- **Natural Lands:** Lands consisting of forests, grasslands, deserts, freshwater and riparian systems, wetlands, coastal and estuarine areas, watersheds, wildlands, or wildlife habitats, or lands used for recreational purposes such as parks, urban and community forests, greenbelts, trails, and other similar open-space lands. For purposes of this paragraph, "parks" includes, but is not limited to, areas that provide public green space (California Public Resources Code (PRC) 9001.5).
- **Working Lands:** Lands used for farming, grazing, or the production of forest products (PRC 9001.5).

2 SUMMARY OF ESTIMATED EXISTING CARBON STOCK IN THE UNINCORPORATED COUNTY

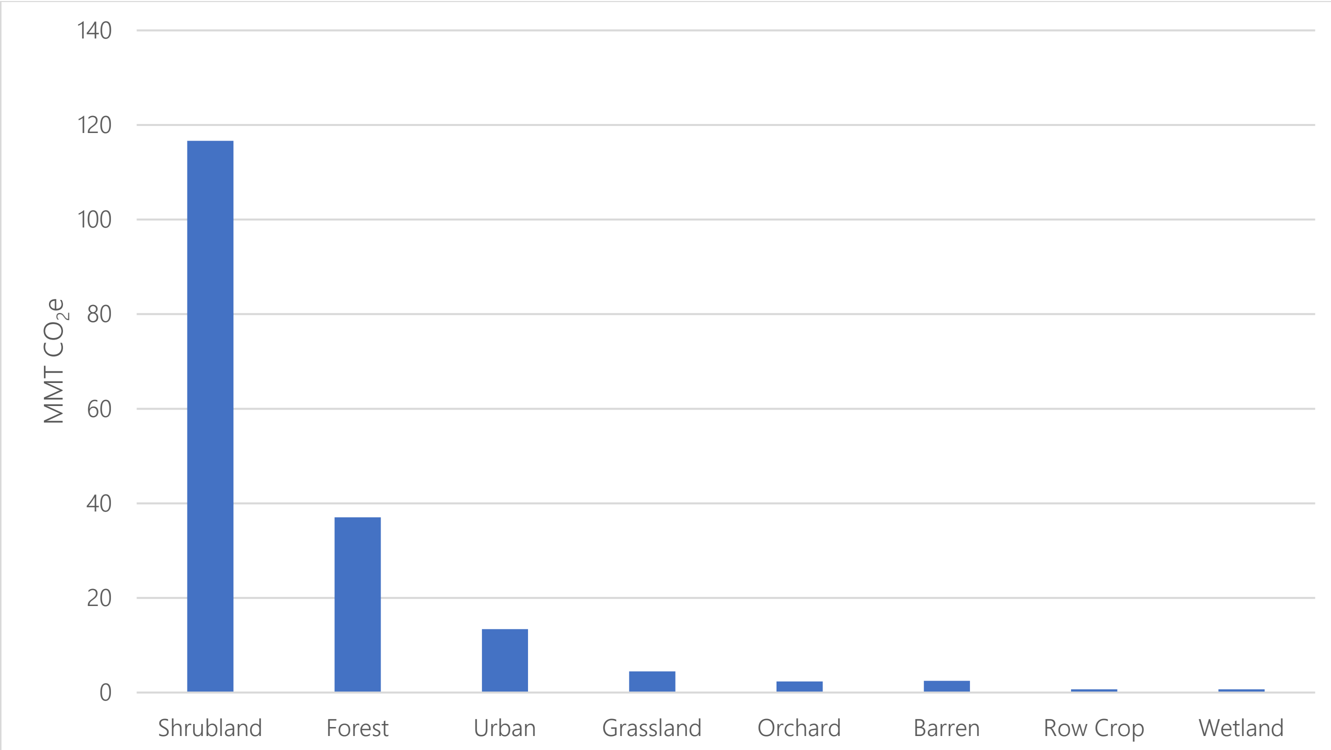
Total carbon stock in the unincorporated county was approximately 178 million metric tons (MMT) of carbon dioxide equivalent (CO_2e) as of 2016.[2] As shown in Table 1 and Figure 2, the majority (87 percent) of this carbon is stored in shrublands and forests, with the rest being stored in urban (developed) areas,[3] grasslands, orchards, barren lands, row crops, and wetlands. Table 1 also shows the average metric tons of carbon stock per acre by landcover type, which highlights that forest and shrublands are the landcover types with the highest stock per acre. These data were taken from SANDAG (2022) using the methods discussed in Section 3.

Table 1 Unincorporated San Diego County Carbon Stock by Land Cover Type in 2016 (MMT CO_2e)

Land Cover Type	MMT CO_2e	Acres	Carbon Stock Rate (MT CO_2e/ acre)
Shrubland	117	1,134,822	102.8
Forest	37	158,638	233.7
Urban	13	235,680	56.9
Grassland	4	68,044	66.0
Orchard	2	33,866	69.7
Barren	2	344,858	7.2
Row Crop	1	14,573	47.6
Wetland	1	14,457	48.4
Total	**178**	**2,004,938**	**88.7**

Notes: CO_2e = carbon dioxide equivalent; MMT = million metric tons.
Source: Ascent 2023.

[2] 2016 is the most recent year for which these data are available and was used as a proxy for 2019, which is the baseline year for the CAP.
[3] See SANDAG (2022: 33): "Urban forests come in many different shapes and sizes and can include urban parks, street trees, landscaped boulevards, gardens, coastal promenades, greenways, and wetlands. Urban trees and their urban canopy cover provide a multitude of benefits, including storing carbon."



Notes: CO_2e = carbon dioxide equivalent; MMT = million metric tons.

Source: Ascent 2023

Figure 2 Unincorporated San Diego County Carbon Stock by Land Cover Type in 2016 (MMT CO_2e)

3 METHODS TO ESTIMATE EXISTING CARBON STOCK IN THE UNINCORPORATED COUNTY

This section describes the data and methods used to estimate existing carbon stock in the unincorporated county by utilizing SANDAG's *Carbon Storage and Sequestration Study for San Diego County*. The data referenced in Sections 3.1 and 3.2 were summarized using a script in the Python computer programming language to calculate total carbon stock by land cover type for the unincorporated county in 2016 (Refer to Appendix A).

3.1 VEGETATIVE CARBON

As discussed in the *Carbon Storage and Sequestration Study for San Diego County*, the 2016 carbon inventory for all of San Diego County (incorporated cities and the unincorporated county) was completed by SANDAG using the US Geological Survey's LANDFIRE raster dataset, which is collected using satellite imagery, to assess the land cover types within the county. LANDFIRE data has a 900 square meter resolution, dividing the San Diego region into a grid of 900 square meter cells. Each cell includes data about the land cover. Specifically, the LANDFIRE data has metric tons of carbon stock for land cover classification types (EVT), vegetation cover classes (EVC), and vegetation height (EVH). EVT is the complexes of plant communities classified through ecological systems classification, EVC is the vertically projected percent cover of the live canopy for a specific area, and EVH is the average height of the dominant vegetation (LANDFIRE, n.d.). These three datasets were intersected to create a layer with a unique combination of EVT, EVC, and EVH in each 900 square meter cell for the entire county.

SANDAG then aggregated EVT provided by LANDFIRE and assigned each EVT to one of the 11 land cover classes: barren, forest, grassland, irrigated pasture, orchard, row crop, shrubland, urban, vineyard, water, and wetland. Additionally, agricultural mapping from LANDFIRE was augmented with the vector data from California Department of Water Resources' statewide crop (DWR 2023a) and land use mapping data (DWR 2023b). The California Department of Water Resources (DWR) uses aerial photography, digital satellite imagery, and new analytical tools to make remote sensing land use surveys possible at a field scale comparable to DWR historical field surveys. The DWR data was then further verified with County of San Diego crop reporting statistics (County of San Diego 2001; County of San Diego 2016).

Metric tons of carbon stock for non-soil carbon were assigned to each unique combination of the EVT-EVC-EHV layers to represent a more holistic carbon density estimation. For the baseline year of 2016, 769 unique combinations were found and assigned a carbon density value. Then they were aggregated for summary purposes into the 11 broad land cover classes (shown in Table 1). Carbon densities (i.e., weight of carbon per unit of soil volume) were found using international, national, state, and local literature and assigned to non-soil and soil carbon pools (SANDAG 2022). The 2001 and 2016 metric tons of carbon stock and correlated land cover types were created by SANDAG in a raster dataset with a resolution of 900 square meters. The dataset was then used to calculate the carbon stock inventories by clipping the spatial data to only include the unincorporated county out of the entire San Diego region. [4] For this analysis, the raster data was first converted into point data, with each point representing a 900 square meter cell. Each point included a carbon stock value for 2001 and 2016, as well as a land cover type classification.

3.2 SOIL CARBON

The US Department of Agriculture's Natural Resource Conservation Service for San Diego County's regional soil survey, maintained and distributed by the San Diego Geographic Information Source (SanGIS), was used by SANDAG to create estimated metric tons of soil carbon stock. Consistent with the US Environmental Protection Agency's GHG inventory methods, specific soil types were grouped into soil classes based on their soil properties and climate zone, including mineral soils, sandy soils, clay soils, volcanic soils, and organic soils (IPCC 2006). Carbon content within the soils of the unincorporated county was included in the raster dataset created by SANDAG. These soil carbon values were incorporated in the total carbon per cell and used in this analysis to determine overall carbon stock and carbon stock per land cover type.

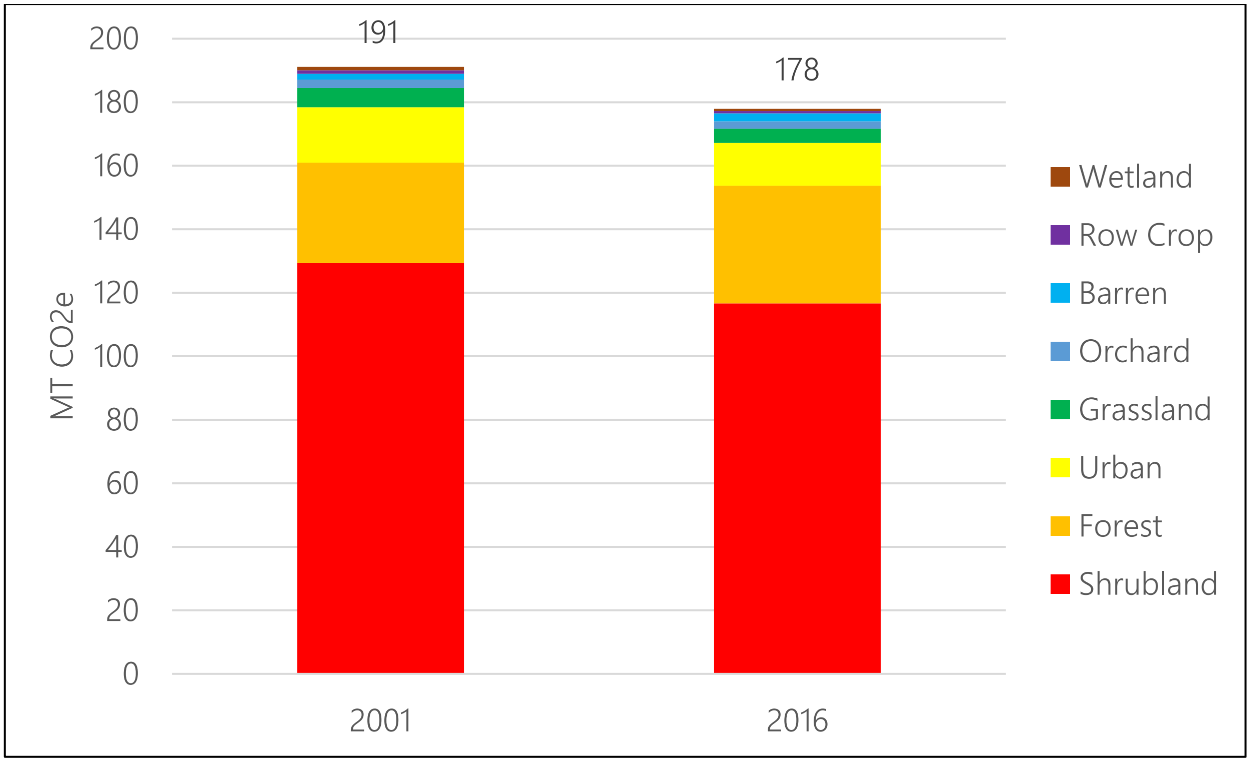
3.3 SEQUESTRATION RATES

The proceeding section describes how the 2001 and 2016 data was used to estimate the rate of change in the quantity of carbon in a carbon pool, or sequestration rates, to understand carbon storage potential of different land cover types when improved land management practices are applied.

Total carbon stock by land cover type for the unincorporated county in 2001 and 2016 was summarized. Overall, the carbon stock declined from approximately 191 MMT CO_2e in 2001 to 178 MMT CO_2e in 2016, or 7 percent, as shown in Figure 3.[5] According to the SANDAG Carbon Storage and Sequestration Study (2022: 14), this is likely due to a combination of disturbance, drought-related tree mortality, and wildfires, which can release carbon from the soil and vegetation. Additionally, the types of land cover changed in many places between 2001 and 2016—for example, some natural lands with the shrubland cover type in 2001 converted to the urban land cover type (e.g., residential development) by 2016, which would have changed the land's ability to sequester carbon. Alternatively, some lands changed from one natural land cover type to another between 2001 and 2016, for example from forest to grassland, which also would have changed the amount of carbon stored in the soil and/or vegetation.

4 Military lands and Tribal lands located within the boundaries of the unincorporated county were excluded from this analysis.

5 Sequestration and storage rates for water, irrigated pasture, and vineyards are not shown separately in the results below. Together, these land cover types represent less than one half of one percent of total area, and thus do not materially affect the results. Their sequestration rates are anomalous and likely due to lack of data.



Notes: CO_2e = carbon dioxide equivalent; MMT = million metric tons.
Source: Ascent 2023.

Figure 3 Unincorporated San Diego County Carbon Stock in 2001 and 2016 (MMT CO_2e)

Wildfires alter the landscape by destroying vegetation and depositing ash, and therefore affect the land's ability to sequester carbon. To account for this, separate sequestration rates were calculated for lands that had been burned, and lands that had not burned. The following steps were taken to perform this calculation. First, carbon stock in 2001 and 2016 was split into lands that had been burned since 1980, and lands that had not been burned since 1980, using the CAL FIRE Historical Perimeters Dataset (CAL FIRE 2023). The change in total carbon stock over the 15-year period from 2001 to 2016 was calculated separately for each subgroup of burned and not burned lands, and then divided by 15 (the number of years between 2001 and 2016) to calculate annual sequestration rates. Table 3 and Figure 4 below shows the results of this calculation.

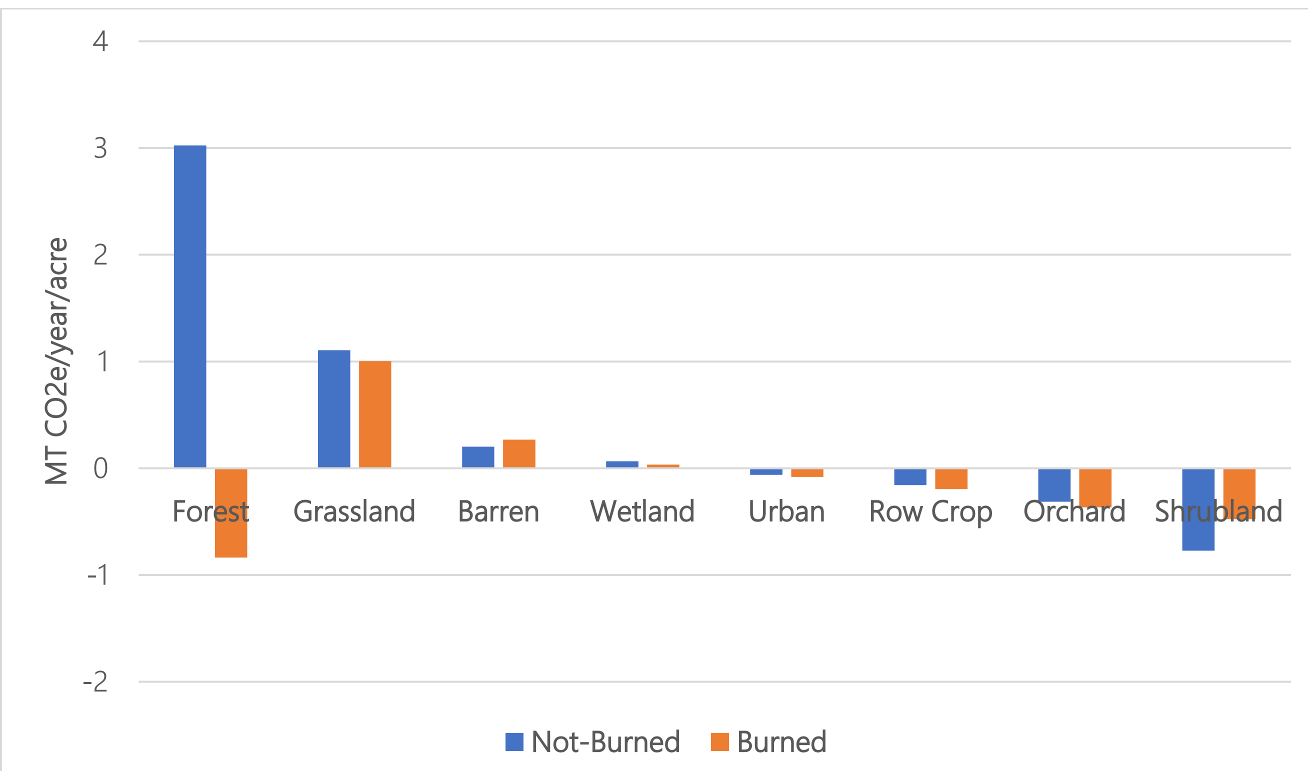
The calculation of sequestration rates only used lands which did not change land cover type from 2001 to 2016 (i.e., a subset of the data shown above—approximately 1.5 million acres out of a total of 2 million in the unincorporated county, or 75 percent). For example, if a given acre was shrubland in both 2001 and 2016, it would be included in the calculation of sequestration rates; if that acre were converted to urban land, that acre would be excluded. The purpose of this step was to estimate a sequestration rate for each land cover type that, where feasible, excludes the effects of human disturbance, land management practices, or development. All these human activities could cause the land type to change.[6] Carbon gains or losses from these activities should not be included in a calculation of the sequestration rate because they do not reflect the natural carbon cycle as described in Section 1.

[6] Detailed data indicating the reason that land cover changed from one type to another in the unincorporated county between 2001 and 2016 were not available and could be due to multiple factors. SANDAG (2022: 14) describes four of those factors. First, "the loss of forest and shrublands to fire, including the major fires of 2003 and 2007, and the subsequent conversion of those areas to other, less-dense vegetation types and younger age classes." Second, "the conversion of higher-carbon-density vegetation types to lower-carbon-density vegetation types as a result of drought, pests/disease, invasive species, and climate change." Third, "land use changes resulting in the conversion of higher-carbon-density natural lands to lower-carbon density urban and barren lands." Fourth, "land use changes resulting in the conversion of higher-carbon-density agricultural lands to lower-carbon density urban and barren lands."

Table 3 Sequestration Rates by Land Cover Type and Burned / Not Burned Status (Excludes Areas Where Land Cover Type Changed Between 2001 and 2016)

2016 Land Cover Type	Total Acres			Sequestration Rates (MT CO_2e/acre/year)			Percent of land that has burned since 1980
	All Lands	Burned	Not Burned	All Lands	Burned	Not Burned	
Shrubland	867,379	437,709	429,670	-0.62	-0.48	-0.77	50%
Barren	322,781	4,177	318,603	0.20	0.27	0.20	1%
Urban	155,971	35,422	120,549	-0.07	-0.08	-0.06	23%
Forest	96,658	59,951	36,708	0.63	-0.84	3.02	62%
Grassland	33,293	12,589	20,705	1.07	1.00	1.11	38%
Orchard	23,912	4,122	19,790	-0.32	-0.37	-0.31	17%
Row Crop	2,960	171	2,789	-0.16	-0.19	-0.16	6%
Wetland	902	263	639	0.06	0.03	0.07	29%
Total	1,503,857	554,404	949,453	-0.26	-0.45	-0.16	37%

Source: Ascent 2023.



Source: Ascent 2023.

Figure 4 Sequestration Rates by Land Cover Type in Unincorporated San Diego County

The sequestration rates show two patterns. First, in general, not burned lands generally sequester carbon at a higher rate than burned lands, with not burned forests and grasslands sequestering carbon at the highest rates.[7] This is likely due to the presence of vegetation that removes carbon dioxide from the air and stores it as carbon in soil and biomass. However, some land cover types are more resilient than others to the effects of wildfires. For example, grasslands' sequestration rate decreases only slightly from having been burned, as opposed to forests which suffer a drastically reduced rate of sequestration. This is because grasslands tend to store more of the carbon belowground, where wildfires cannot affect it, whereas forests store more carbon in aboveground woody biomass such as trees (Kerlin 2018).

Second, many land cover types have negative sequestration rates. Urban, shrubland, orchard, and row crops are all land cover types with negative sequestration rates between 2001 and 2016. A negative sequestration rate means that a land cover type is a source of emissions instead of a sink; this can be due to soil disturbances (especially in urban environments and agricultural areas such as vineyards and orchards), wildfires, methane emissions from decomposing biomass, or drought. In the case of shrublands, vegetation density and height declined from 2001 to 2016[8], which contributed to the reduction in carbon stock over time (and thus negative sequestration rate).

[7] Shrublands and barren lands are notable exceptions. In the case of shrublands, these lands have dry soil and sparse vegetation, and thus have the overall lowest sequestration rates of any land cover type included in this analysis. Wildfires produce ash which creates more fertile soil and later plant growth, so wildfires may increase the sequestration rate for shrublands over time. Additionally, shrublands likely store most of their carbon below ground, so fires do not deplete shrubland carbon stock as much as they affect carbon pools with greater aboveground carbon storage, such as forests. In the case of barren lands, the sequestration rate results are likely an anomaly due to small sample size—only 1 percent have burned since 1980.

[8] See SANDAG (2022: 12-13): "Average carbon densities in the forest and shrubland vegetation types also decreased over this period, which is indicative of a shift to vegetation that is less dense, potentially due to drought or mortality, and with less height, potentially due to type conversion, disturbance, or mortality."

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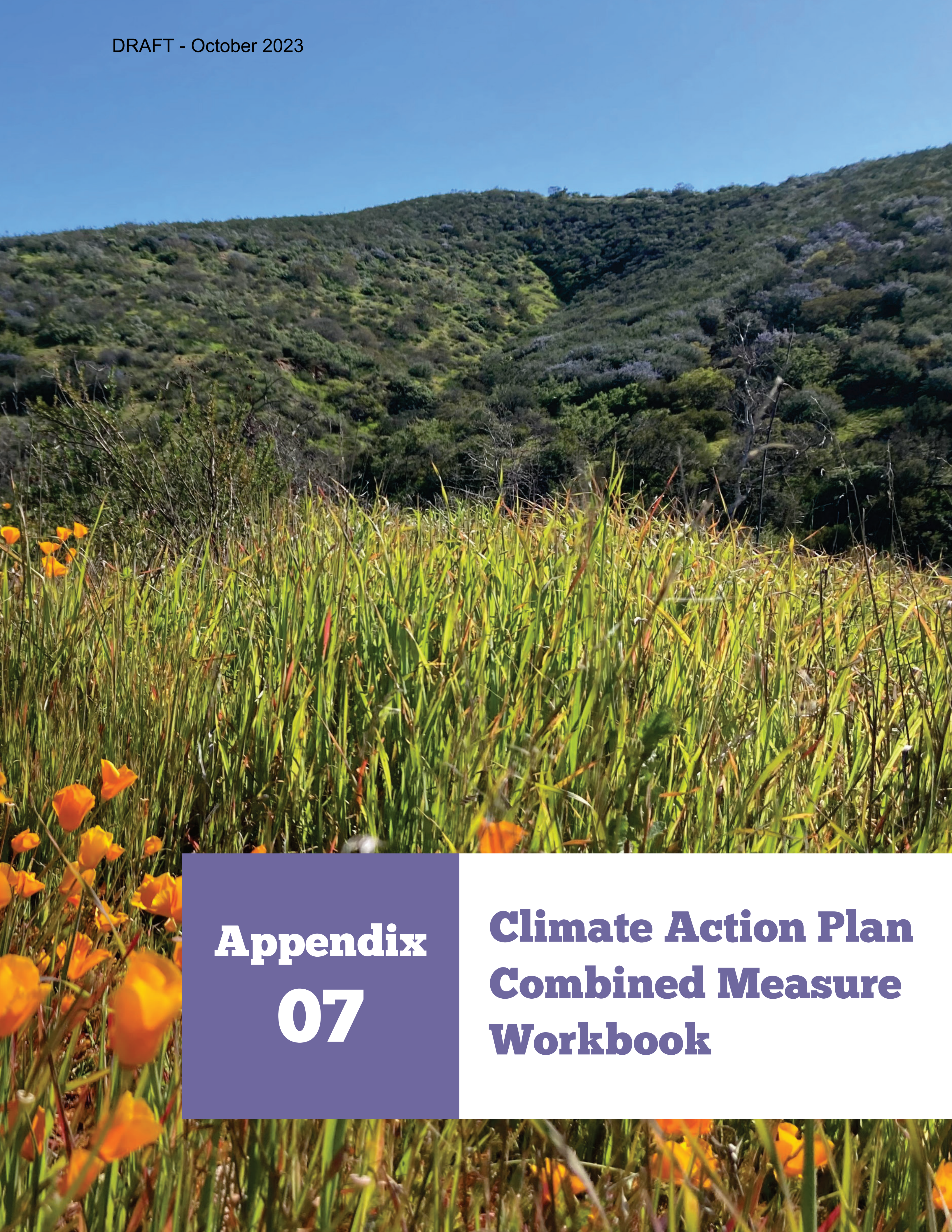

Appendix 07

Climate Action Plan Combined Measure Workbook

GHG Measure Reduction Summary

Anthropogenic GHG Emissions Projections with Legislative Reductions

Emissions Category	GHG Emissions ($MTCO_2e$)					
	2019	2030	2035	2040	2045	2050
On-road Transportation	1,331,000	1,033,000	756,000	513,000	512,000	527,000
Electricity	599,000	202,000	38,000	20,000	0	0
Natural Gas	478,000	540,000	561,000	579,000	597,000	616,000
Solid Waste	193,000	219,000	206,000	194,000	184,000	175,000
Agriculture	134,000	127,000	124,000	122,000	120,000	118,000
Propane	121,000	127,000	129,000	131,000	132,000	133,000
Off-road Transportation	71,000	99,000	106,000	110,000	114,000	118,000
Water	39,000	31,000	8,000	4,000	0	0
Wastewater	18,000	19,000	19,000	19,000	19,000	19,000
TOTAL Emissions with Legislative Reductions	**2,984,000**	**2,397,000**	**1,947,000**	**1,693,000**	**1,678,000**	**1,705,000**
Percent Reduction from 2019 with Legislative Reductions		-19.7%	-34.8%	-43.3%	-43.8%	
CAP Targets (percent reduction from 2019 levels)		-43.6%	-58.8%	-71.9%	-85.4%	
CAP Targets ($MTCO_2e$)		1,683,156	1,229,840	837,806	434,185	
Needed reductions to meet CAP Targets from 2019 levels ($MTCO_2e$)		1,300,844	1,754,160	2,146,194	2,549,815	
Needed reductions to meet CAP Targets from Legislative reductions		713,844	717,160	855,194	1,243,815	

Anthropogenic GHG Emission Reductions by Sector (Community)

Sector	GHG Reduction ($MTCO_2e$)				
	2030	2035	2040	2045	2050
Solid Waste	39,177	67,228	91,346	117,943	112,621
Water and Wastewater	10,488	4,064	2,981	1,869	1,869
Agriculture and Conservation (A-1.1 A-3.1, A-5.1)	74,500	93,165	110,491	128,183	146,276
Energy	319,382	282,621	370,632	519,440	586,593
Built Environment and Transportation	247,224	270,046	310,257	425,078	578,103
TOTAL Reductions from Community Measures	**690,770**	**717,123**	**885,707**	**1,192,515**	**1,425,463**

Anthropogenic GHG Emission Reductions by Sector (County Operations)

Sector	GHG Reduction ($MTCO_2e$)				
	2030	2035	2040	2045	2050
Solid Waste	1,048	4,406	6,703	10,855	9,970
Water and Wastewater	3	1	0	0	0
Agriculture and Conservation	0	0	0	0	0
Energy	13,715	14,698	16,135	16,858	17,582
Built Environment and Transportation	21,607	20,881	17,776	23,663	24,869
TOTAL Reductions from County Operations Measures	**36,373**	**39,985**	**40,613**	**51,376**	**52,421**

Carbon Storage Measures

Sector (Action)	GHG Reduction ($MTCO_2e$)				
	2030	2035	2040	2045	2050
Agriculture and Conservation (A-1.2)	76	459	841	1,223	-
Agriculture and Conservation (A-2.1)	2,498	3,675	4,852	6,029	7,206
Agriculture and Conservation (A-2.2)	439	601	674	747	821
Agriculture and Conservation (A-4.1)	10,758	47,691	84,623	121,556	0
TOTAL Reductions from Carbon Storage Measures	**13,771**	**52,425**	**90,991**	**129,556**	**8,027**

Analysis of CAP Targets Achievement with Anthropogenic GHG Emissions Reductions Measures

Sector	GHG Emissions ($MTCO_2e$)				
	2030	2035	2040	2045	2050
Solid Waste	178,776	134,367	95,951	55,202	52,409
Water and Wastewater	39,510	22,936	20,019	17,131	17,131
Agriculture and Conservation (A-1.1 A-3.1, A-5.1)	52,500	30,835	11,509	-8,183	-28,276
Energy (Electricity, Natural Gas, Propane)	535,903	430,681	343,234	192,701	144,826
Built Environment and Transportation (On-road and Off-road Transportation)	863,169	571,073	294,967	177,258	42,028
TOTAL	**1,669,858**	**1,189,892**	**765,680**	**434,109**	**228,117**
Percent Reduction Below 2019 Levels	-44.0%	-60.1%	-74.3%	-85.5%	-92.4%
Additional Reductions Needed to meet CAP Targets ($MTCO_2e$) (negative value = surplus reductions)	-13,299	-39,948	-72,127	-76	

Analysis of CAP Targets Achievement with Anthropogenic GHG Emissions Reductions and Carbon Storage

Sector	GHG Emissions ($MTCO_2e$)				
	2030	2035	2040	2045	2050
Total GHG Emissions with Anthropogenic GHG Emissions Reductions	1,669,858	1,189,892	765,680	434,109	228,117
Percent reduction below 2019 levels	-44.0%	-60.1%	-74.3%	-85.5%	-92.4%
GHG Emissions Removed By Carbon Storage Measures	13,771	52,425	90,991	129,556	8,027
Total GHG Emissions with Anthropogenic GHG Emissions Reductions and Carbon Storage Measures	1,656,086	1,137,467	674,689	304,553	220,090
Percent reduction below 2019 levels	-44.5%	-61.9%	-77.4%	-89.8%	-92.6%
Additional Reductions/Storage Needed to meet Aspitational Goal: Net Zero ($MTCO_2e$)	1,656,086	1,137,467	674,689	304,553	220,090

Target Setting for County of San Diego CAP Update

County of San Diego Target Emissions and Target Percent Reduction from 2019 Emissions Levels			
Year	Target Emissions Levels (MTCO2e/yr)	CAP GHG Reduction Target (relative to 2019 levels)	Reductions from Legislative BAU Needed to Achieve Target (MTCO2e/yr)
2019	2,984,000	--	--
2030	1,683,156	43.6%	713,844
2035	1,229,840	58.8%	717,160
2040	837,806	71.9%	855,194
2045	434,185	85.4%	1,243,815

Notes:
MTCO2e/yr = metric tons carbon dioxide equivalent per year

CARB 2022 Scoping Plan - Emissions Reductions by Sector

Sectors	CARB's Statewide GHG Inventory (MMTCO2e/yr)	2022 Scoping Plan Scenario (MMTCO2e/yr)			
	2019	2030	2035	2040	2045
Agriculture	31.40	20.10	18.34	16.56	15.30
Residential and Commercial	40.50	26.82	17.77	9.70	4.40
Electric Power	60.20	39.20	31.11	27.92	8.68
High Global Warming Potential (GWP)	20.70	9.90	9.80	9.70	9.00
Industrial	80.40	40.55	29.14	18.50	11.52
Recycling and Waste	8.80	9.18	8.72	8.34	7.99
Transportation	162.40	80.58	53.06	26.71	7.94
Carbon Dioxide Removal (CDR)	0.00	-6.77	-35.11	-62.90	-74.99
Total	**404.4**	**219.6**	**132.8**	**54.5**	**-10.2**

Notes:
MMTCO2e/yr = million metric tons carbon dioxide equivalent per year
Sources:
https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents
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Applicable Emission Sectors

Emission Sectors	Applicable to County of San Diego?
Agriculture	Yes
Residential and Commercial	Yes
Electric Power	Yes
High Global Warming Potential (GWP)	No
Industrial	Yes
Recycling and Waste	Yes
Transportation	Yes
Carbon Dioxide Removal (CDR)	No

Application of Statewide Emissions Reductions by Sector to Applicable Sectors in the County of San Diego

Milestone Year	All Statewide Sectors		Statewide Sectors Applicable to County of San Diego	
	Statewide Emissions (2019 Inventory and 2022 Scoping Plan Scenario) (MMTCO2e)	Percent Reduction from 2019 levels	Statewide Emissions (2019 Inventory and 2022 Scoping Plan Scenario) (MMTCO2e)	Percent Reduction from 2019 levels
2019	404.40	n/a	384	n/a
2030	219.56	46%	216	43.6%
2035	132.83	67%	158	58.8%
2040	54.53	87%	108	71.9%
2045	-10.16	103%	56	85.4%

Notes:
MMTCO2e/yr = million metric tons carbon dioxide equivalent per year

Sector	Strategy	Measure	ID	Action	GHG Reductions by Action ($MTCO_2e$)			
					2030	2035	2040	2045
Solid Waste	Increase Solid Waste Diversion in the Unincorporated Area and County Operations	SW-1: Achieve zero waste in County operations	SW-1.1	Adopt a County Operations zero waste policy by 2030 to achieve zero waste (90% diversion).	1,048	1,571	1,571	1,571
		SW-2: Achieve zero waste within the unincorporated area	SW-2.1	Update the County's Strategic Plan to Reduce Waste by 2028 to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.	37,804	44,313	51,001	57,779
	Increase Availability of Sustainable Solid Waste Facilities in the Unincorporated Area and County Operations	SW-3: Improve waste management practices at County-owned solid waste facilities to reduce emissions	SW-3.1	Expand landfill gas systems at County-owned landfills to exceed State requirements by 10% by 2045.	-	2,834	5,131	9,283
		SW-4: Improve waste management practices in the unincorporated area to reduce emissions and increase waste diversion	SW-4.1	Conduct a feasibility study by 2027 and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% by 2045 in the incorporated area.	1,373	22,915	40,345	60,164
				Total	***40,224***	***71,633***	***98,049***	***128,798***

SW-1.1
Adopt a County Operations zero waste policy by 2030 to achieve zero waste (90% diversion).

	2019	2030	2035	2040	2045
Solid waste emissions ($MTCO_2e$)	3,000	2,000	3,000	3,000	3,000
Waste Diversion Rate [1]	79%	90%	90%	90%	90%
Increased waste diversion		11%	11%	11%	11%
Adjusted forecasted emissions from solid waste ($MTCO_2e$)		952	1,429	1,429	1,429
Reduced solid waste emissions ($MTCO_2e$)		**1,048**	**1,571**	**1,571**	**1,571**

[1] Data provided by County (see cell L2 in measure tracking sheet)

SW-2.1
Update the County's Strategic Plan to Reduce Waste by 2028 to include strategies to achieve 80% diversion by 2030 and zero waste (90% diversion) by 2045.

	2019	2030	2035	2040	2045
GHG Emissions from unincorporated county waste disposal ($MTCO_2e$)	73,641	75,608	75,965	76,502	77,039
Waste Diversion Rate [1]	60%	80%	83%	87%	90%
Increased waste diversion		20%	23%	27%	30%
Adjusted forecasted emissions from solid waste ($MTCO_2e$)		37,804	31,652	25,501	19,260
Reduced solid waste emissions ($MTCO_2e$)		**37,804**	**44,313**	**51,001**	**57,779**

[1] County of San Diego Climate Action Plan Dashboard

SW-3.1
Expand landfill gas systems at County-owned landfills to exceed State requirements by 10% by 2045.

	2019	2030	2035	2040	2045
Emissions from County owned landfills [3] [4]	23,415	18,795	17,006	15,394	13,925
Current LFG capture% [1]	85%	85%	85%	85%	85%
Targeted LFG capture % [2]		85%	87.5%	90%	95%
Increased LFG capture % (see notes)		0%	3%	5%	10%
Emissions reduction		**-**	**2,834**	**5,131**	**9,283**

[1] San Diego County Air Pollution Control District (n.d.). Emissions Inventory Request Instructions. Landfill Operations. Available:
From source [1] cited here: "The District will default to a collection efficiency of the landfill gas collection system of 85% as aligned with CARB's regulation
[2] *Current MSW Industry Position and State-of-the-Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills (v2, prepared by SCS Engineers 2009)*
The source reported that collection efficiencies upwards of 90% can be achieved for landfills with clay covers and landfill gas recovery systems.
[3] All County owned landfills are closed landfills
[4] Fugitive emissions exclude emissions from Viejas landfill as the landfill does not have an existing LFG system and County staff have indicated infeasibility to install one.

SW-4.1
Conduct a feasibility study by 2027 and implement a landfill gas system pilot project at privately managed landfills by 2030 to exceed State requirements by 10% by 2045 in the incorporated area.

	2030	2035	2040	2045
Emissions from Borrego Landfill ($MTCO_2e$)	1,615	1,461	1,322	1,196
Existing LFG Capture (%) [1]				
Emissions from Otay Landfill ($MTCO_2e$)	119,519	108,145	97,854	88,542
Existing LFG Capture (%) [2]				
LFG capture after implementing the incentives program [3]	85%	88%	91%	95%
Increased LFG capture at Borrego Landfill under incentive program	85%	88%	91%	95%
Emissions reductions at Borrego Landfill ($MTCO_2e$)	1,373	1,286	1,203	1,136
Increased LFG capture at Otay Landfill under incentives program	0%	3%	6%	10%
Emissions reductions at Otay Landfill ($MTCO_2e$)	-	21,629	39,142	59,028
Emissions Reduction ($MTCO_2e$)	**1,373**	**22,915**	**40,345**	**60,164**

[1] Borrego Landfill does not currently have a landfill gas capture (LFG) system.

[2] SDAPCD Landfill Operations Emissions Calculation Methodology (last updated November 1, 2021). Available:
https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/landfill/APCD-landfill1-revised-Nov-2nd-2021.pdf

Per this source: "Based on CARB’s Staff Report: Initial Statement of Reasons for the Proposed Regulation to Reduce Methane Emissions from Municipal Solid Waste Landfills dated May 2009, the District will apply a landfill gas collection efficiency of 85% when calculating fugitive gas in all emission inventories completed for reporting years 2016 and later, if the facility has been subject to CARB’s regulation to reduce Methane Emissions from Municipal Solid Waste Landfills."

[3] *Current MSW Industry Position and State-of-the-Practice on LFG Collection Efficiency, Methane Oxidation, and Carbon Sequestration in Landfills (v2, prepared by SCS Engineers 2009)*
The source reported that collection efficiencies upwards of 90% can be achieved for landfills with clay covers and landfill gas recovery systems.

Sector	Strategy	Measure	ID	Action	GHG Reductions by Action ($MTCO_2e$)			
					2030	2035	2040	2045
Water and Wastewater	Decrease Potable Water Consumption in the Unincorporated Area and County Operations	W-1: Develop policies and programs to increase water efficiency, retention, recycling, and reuse to reduce potable water consumption in County operations	W-1.1	Implement the County's Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.	3	1	0	-
		W-2: Develop policies and programs to increase indoor and outdoor water conservation (including water efficiency, retention, recycling, and reuse) in new and existing development in the unincorporated area	W-2.1	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 17% in the unincorporated area.	37	16	16	-
			W-2.2	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements for existing development projects with qualifying improvements.	320	81	41	-
			W-2.3	Update the Green Building Incentive program by 2026 to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.	64	16	8	0
			W-2.4	Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.	21	9	6	0
	Increase Stormwater Collection, Water Pumping, and Wastewater Treatment Efficiency	W-3: Develop programs to increase stormwater and wastewater treatment efficiency to reduce imported potable water use in the unincorporated area	W-3.1	Increase wastewater treatment efficiency through the East County Advanced Water Purification Program to produce 12,900 acre feet of water each year by 2030.	10,046	3,942	2,911	1,869
				Total	**10,490**	**4,064**	**2,981**	**1,869**

W-1.1
Implement the County's Water Efficiency Plan to require water-efficiency measures in new and existing County buildings/operations to reduce potable water use by 19% by 2030.

	2019	2030	2035	2040	2045
County facility water use without water efficiency measures (gal) [1]	394,890,322	443,699,209	459,396,125	473,091,229	486,786,332
County facility water use with water efficiency measures (gal) [2]	394,890,322	319,514,362			
Forecasted number of County employees		21,153	21,901	22,554	23,207
Water use per employee based on 2030 water consumption (gal/employee) [3]		15,105			
Forecasted County facility water use with water efficiency measures (gal)		319,514,362	330,817,943	340,679,990	350,542,037
Forecasted water savings each target year (gal)		124,184,847	128,578,181	132,411,239	136,244,296
Water savings (million gal) [4]		124	129	132	136
% savings from 2019 water consumption		19%	67%	66%	65%
Local Water Distribution EF (kWh/million gal) [5] [6]					
Energy savings (MWh)		36	38	39	40
County-Specific electricity EF ($MTCO_2e$/MWh) [6]		0.074	0.014	0.007	-
Emission reduction ($MTCO_2e$)		**3**	**1**	**0**	**-**

Projected water savings from DGS's Water Conservation Plan (HCF) [2]	100,770
Projected water savings from DGS's Water Conservation Plan (gal)	75,375,960
HCF to gallons conversion factor	748

Notes

[1] Net water usage in 2019: Data from DPW provided by County. Scaled by projected growth in number of County employees.
[2] DGS' Water Conservation Plan provided by County (Claire Moss) to Ascent on April, 12, 2023: 100,770 HCF water savings in 2030 (Table ES-3)
[3] Assumes that water use per employee would be constant starting in 2030 (based on water savings from the Water Conservation Plan)
[4] HCF refers to hundred cubic feet, also referred to as one "unit" of water, equivalent to 748 gallons.
[5] Average of City of San Diego's three Water Treatment Plants
[6] Most County facilities are located outside unincorporated county

W-2.1
Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements and reduced outdoor water use for landscaping requirements for new development to reduce potable water consumption from new development by 17% in the unincorporated area.

	2019	2020	2025	2030	2035	2040	2045
Total water-related electricity use (MWh)							
Upstream Electricity Use	161,000	161,800	165,000	166,000	166,000	168,000	169,000
Local Treatment and Distribution Electricity Use	12,000	14,000	22,000	22,000	22,000	22,000	22,000
Water-related electricity use: existing development (MWh)							
Upstream Electricity Use			165,000	165,000	165,000	165,000	165,000
Local Treatment and Distribution Electricity Use			22,000	22,000	22,000	22,000	22,000
Water-related electricity use: new development (MWh) assuming the updated code is implemented from 2026 [5]							
Upstream Electricity Use				1,000	1,000	3,000	4,000
Local Treatment and Distribution Electricity Use				-	-	-	-
Electricity use associated with water use in new non-residential development (MWh)							
Upstream Electricity Use [1]				320	320	960	1,280
Local Treatment and Distribution Electricity Use [1]				-	-	-	-
Water share by SDCWA member agency water authority supply (%)	79%						
Water share by SDCWA member agency local supply (%)	14%						
Groundwater Supply (%)	7%						
Upstream energy intensity (kWh/AF)	1,946						
Local distribution energy intensity (kWh/AF)	139						
New Residential Development							
Number of residents in homes with grey water systems (increase from 2025) [5]				2,327	4,654	8,155	11,656
Gal per day per occupant from showers, bathtubs, and lavatories (2019 CA Plumbing Code)				25	25	25	25
Gal per day per occupant for laundry (2019 CA Plumbing Code)				15	15	15	15
Days per year				365	365	365	365
AF per gallon	0.00000307						
Outdoor water savings from using greywater (AF/yr)				104	209	366	522
Water share by SDCWA member agency water authority supply (AF)				82	164	288	411
Electricity required (kWh)				159,801	319,603	560,026	800,449
Water share by SDCWA member agency local supply (AF)				15	30	53	75
Electricity required (kWh)				2,091	4,182	7,328	10,474
Groundwater Supply (AF)				7	14	25	36
Electricity required (kWh)				992	1,985	3,478	4,971
Electricity savings from greywater - upstream (kWh)				159,801	319,603	560,026	800,449
Electricity savings from greywater - local (kWh)				22	44	78	111
Electricity savings from greywater - upstream (MWh)				160	320	560	800
Electricity savings from greywater - local (MWh)				0.02	0.04	0.08	0.11
New Non-Residential Development							
CALGreen Tier 2 water consumption reduction target for new non-residential development (%) [3] [4]			20%	20%	20%	20%	20%
Reduced electricity consumption (MWh) from water use in new non-residential development		0					
Upstream Electricity Use				64	64	192	256
Local Treatment and Distribution Electricity Use				-	-	-	-
GHG Reductions							
Electricity Emission Factor ($MTCO_2e$/MWh)							
Upstream (California Statewide Average)				0.17	0.04	0.02	-
Local Grid Supply				0.17	-	0.02	-
New Residential, Emissions Reduction ($MTCO_2e$)							
Upstream Electricity Use				26.60	13.34	11.69	-
Local Treatment and Distribution Electricity Use				0.004	-	0.002	-
Total Emissions Reduction, New Residential Development ($MTCO_2e$)				26.61	13.34	11.69	-
New Nonresidential, Emissions Reduction ($MTCO_2e$)							
Upstream Electricity Use				11	3	4	-
Local Treatment and Distribution Electricity Use				-	-	-	-
Total Emissions Reduction, New Nonresidential Development ($MTCO_2e$)				10.65	2.67	4.01	-
Total Emissions Reductions ($MTCO_2e$), Residential and Nonresidential Development				**37**	**16**	**16**	**-**
Percentage Change in Water-related Electricity Use Relative to 2030 projection				17%			

[1] Proportion of water end uses in urban consumption data

Residential outdoors	31%
Residential indoors	37%
Commercial and institutional outdoors	15%
Commercial and institutional indoors	10%
Industrial	5%
Energy Production	2%

Source: California Department of Water Resources, found at PPCI, 2023. Water Use in California's Communities. Available: https://www.ppic.org/publication/water-use-in-californias-communities/

Total non residential indoors	17%
Total non-residential outdoors	15%

[2] CALGreen Tier 2 non-residential Prerequisite: 20% or 25% water savings over the "water use baseline". Source: A5.602.2 CALGreen VERIFICATION GUIDELINES TIER 2 CHECKLIST 2022 CALGreen Code. Available: https://www.dgs.ca.gov/-/media/Divisions/BSC/CALGreen/BSC-TP132c-2022-CALGreenTier-2-

[3] A water reduction prerequisite amount is not available from CALGreen Tier 2 for non-residential uses. The measure quantification uses greywater as a proxy for outdoor water reduction.

[4] Elective measures from CA Green Building Code Source: section 4.3 (Source: https://codes.iccsafe.org/content/CAGBC2022P1/chapter-5-nonresidential-mandatory-measures)	Related measures in CAPCOA, 2021 Measures (GHG reduction potential)
A. Rainwater catchment system	not in CAPCOA
B. Potable water elimination Use of captured rainwater Use of recycled water Water treated for irrigation use of greywater use of drought tolerant plant	Use Locally Sourced Water Supply (moderate); Use Grey Water (small); Design Water-Efficient Landscapes (small)
C. Landscape water meter	not in CAPCOA

[5] Amended County's Code of Regulatory Ordinances to be implemented from 2025

W-2.2

Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar water efficiency requirements for existing development projects with qualifying improvements.

		2030	**2035**	**2040**	**2045**
Average annual improvement to newly permitted system in non-residential land use (Addition) (A) in sq ft [1]	21,910				
Water use (gal) [4]	6,281,011				
CALGreen Tier 2 Water consumption reduction target for non-residential development (%) [2]		20%	20%	20%	20%
Residential capture rate	5%				
Number of residents in homes with grey water systems (increase from 2025) [5]		24,633	24,749	24,924	25,099
Gal per day per occupant from showers, bathtubs, and lavatories (2019 CA Plumbing Code)		25	25	25	25
Gal per day per occupant for laundry (2019 CA Plumbing Code)		15	15	15	15
Days per year		365	365	365	365
AF per gallon	0.00000307				
Outdoor water savings from using greywater (AF)		1,104	1,109	1,117	1,125
Reduced water consumption in improvement to newly permitted system in residential land use (gal)		359,638,150	361,336,860	363,892,590	366,448,320
Reduced water consumption in improvement to newly permitted system in existing non-residential land uses (gal)		1,256,202	1,256,202	1,256,202	1,256,202
Total reduced water consumption (gal)		360,894,352	362,593,062	365,148,792	367,704,522
Water share by SDCWA member agency water authority supply (%)	79%				
Water share by SDCWA member agency local supply (%)	14%				
Groundwater Supply (%)	7%				
Water share by SDCWA member agency water authority supply (gal)		284,138,583	285,476,007	287,488,179	289,500,351
Electricity required (MWh)		1,818	1,827	1,840	1,852
Water share by SDCWA member agency local supply (gal)		52,051,345	52,296,348	52,664,958	53,033,567
Electricity required (MWh)		54	54	54	55
Groundwater Supply (gal)		24,704,424	24,820,707	24,995,655	25,170,603
Electricity required (MWh)		50	50	50	51
Total Upstream Electricity Use		1,818	1,827	1,840	1,852
Local Treatment and Distribution Electricity Use		103	104	105	105
Electricity Emission Factor ($MTCO_2e/MWh$)	Upstream (California Statewide Average)	0.1665	0.0417	0.0209	-
	Local Grid Supply	0.1665	0.0417	0.0209	-
GHG Reductions ($MTCO_2e$)		**320**	**81**	**41**	**-**

[1] Permit data provided by County on April 26 2023
[2] CALGreen Tier 2 non-residential Prerequisite: 20% or 25% water savings over the "water use baseline". Source: A5.602.2 CALGreen VERIFICATION GUIDELINES TIER 2 CHECKLIST 2022 CALGreen Code.
A water reduction prerequisite amount is not available from CALGreen Tier 2 for non-residential uses. The measure quantification uses greywater as a proxy for outdoor water reduction.

Elective measures from CA Green Building Code Source: section 4.3 (Source: https://codes.iccsafe.org/content/CAGBC2022P1/chapter-5-nonresidential-mandatory-measures)	Related measures in CAPCOA, 2021 Measures (GHG reduction mitigation potential)
A. Rainwater catchment system	not in CAPCOA
B. Potable water elimination Use of captured rainwater Use of recycled water Water treated for irrigation use of greywater use of drought tolerant plant	Use Locally Sourced Water Supply (moderate); Use Grey Water (small); Design Water-Efficient Landscapes (small)
C. Landscape water meter	not in CAPCOA

[4] CALEEMOD results

Land use	Quantity	Unit	Total sq ft	Indoor water use (Mgal)	Outdoor water use (Mgal)
Res (condo/townhouse)	100	DU	100000	6.5154	4.10754
Non-res (general office)	100	1000 sq ft	100000	17.7734	10.8934
Note: CalEEMod v 2020.4.0 used for estimating water consumption					
See SDCv8.pdf		(284,113,950)			

[5] Amended County's Code of Regulatory Ordinances to be implemented from 2025

Note: Permit data provided by County on April 26 2023
Improvement to newly permitted system (Addition) greater than 20 sq ft — A
Update to existing structure (Alteration) greater than 20 sq ft — B
From the data provided by County on addition and alteration of existing buildings, following assumptions have been made:
New Primary Residential Structure is marked B as per County emails -
Rebuild on Existing Foundation is identified as A
Major Remodel, No Addl Sq. Ft. is not factored in as there is no sq ft built (only demolished)
Demolition SFD is not factored in as there is no sq ft built (only demolished)
Records with no completion year are not taken into consideration
Records for the year 2023 are not taken into consideration

W-2.3
Update the Green Building Incentive program by 2026 to include incentives for water efficiency, conservation, and reuse improvements for new and existing development to reduce potable water consumption in the unincorporated area.

		2025	2030	2035	2040	2045
CALGreen Tier 2 Water consumption reduction target for non-residential development (%) [2]			20%	20%	20%	20%
Number of residents in homes with grey water systems	*assuming 1% participation*		4,927	4,950	4,985	5,020
Gal per day per occupant from showers, bathtubs, and lavatories (2019 CA Plumbing Code)			25	25	25	25
Gal per day per occupant for laundry (2019 CA Plumbing Code)			15	15	15	15
Days per year			365	365	365	365
AF per gallon	0.00000307					
Outdoor water savings from using greywater (AF)			221	222	223	225
Number of residents per housing unit			3	3	3	3
Housing units with greywater			1,521	1,544	1,554	1,565
Reduced water consumption in improvement to newly permitted system in residential land use (gal)			71,927,630	72,267,372	72,778,518	73,289,664
Water consumed by non residential developments compared to total water consumption (%) [4]	32%					
Non residential water consumption (acre-ft)		31,630	31,781	31,931	32,157	32,382
Non residential water consumption in existing developments (acre-ft)			31,630	31,630	31,630	31,630
Reduction in water consumption in non residential developments (%)	20%					
Reduced water consumption in improvement to newly permitted system in non-res land use (gal)	*assuming 1% participation*		63	63	63	63
Total reduced water consumption			71,927,693	72,267,435	72,778,581	73,289,727
Water share by SDCWA member agency water authority supply (%)	79%					
Water share by SDCWA member agency local supply (%)	14%					
Groundwater Supply (%)	7%					
Water share by SDCWA member agency water authority supply (gal)			56,629,960	56,897,445	57,299,880	57,702,314
Electricity required (MWh)			362.35	364.07	366.64	369.22
Water share by SDCWA member agency local supply (gal)			10,374,042	10,423,043	10,496,765	10,570,487
Electricity required (MWh)			10.67	10.72	10.79	10.87
Groundwater Supply (gal)			4,923,691	4,946,947	4,981,937	5,016,927
Electricity required (MWh)			9.93	9.97	10.04	10.12
Total Upstream Electricity Use			362.35	364.07	366.64	369.22
Local Treatment and Distribution Electricity Use			20.59	20.69	20.84	20.98
Electricity Emission Factor ($MTCO_2e/MWh$)	Upstream (California Statewide Average)		0.17	0.04	0.02	-
	Local Grid Supply		0.17	0.04	0.02	-
GHG Reduction ($MTCO_2e$)			**64**	**16**	**8**	**-**

[1] Data provided by County on April 26 2023
[2] CALGreen Tier 2 non-residential Prerequisite: 20% or 25% water savings over the "water use baseline". Source: A5.602.2 CALGreen VERIFICATION GUIDELINES TIER 2 CHECKLIST 2022 CALGreen Code. Available:
A water reduction prerequisite amount is not available from CALGreen Tier 2 for residential uses. The measure quantification uses greywater as a proxy for outdoor water reduction.

Elective measures from CA Green Building Code Source: section 4.3 (Source: https://codes.iccsafe.org/content/CAGBC2022P1/chapter-5-nonresidential-mandatory-measures)	Related measures in CAPCOA, 2021 Measures (GHG reduction mitigation potential)
A. Rainwater catchment system	not in CAPCOA
B. Potable water elimination Use of captured rainwater Use of recycled water Water treated for irrigation use of greywater use of drought tolerant plant	Use Locally Sourced Water Supply (moderate); Use Grey Water (small); Design Water-Efficient Landscapes (small)
C. Landscape water meter	not in CAPCOA

[3] Amended County's Green Building Incentive Program to be implemented from 2026
[4] Source: California Department of Water Resources, found at PPCI, 2023. Water Use in California's Communities. Available: https://www.ppic.org/publication/water-use-in-californias-communities/

W-2.4
Implement the Waterscape Rebate Program to incentivize water efficiency and conservation to reduce outdoor water consumption in the unincorporated area.

	2019	2021	2030	2035	2040	2045
Turf removal						
Units (sq ft) [1]		72,972	450,000	700,000	950,000	1,200,000
Water savings in gal [1]	3,380,006	6,944,814	22,986,450	35,756,700	48,526,950	61,297,200
% saving fromTurf removal		96%	95%	95%	95%	95%
Stormwater harvesting system						
Units (number of barrels and cisterns) [1]		312	1,800	2,800	3,800	4,800
Water savings in gal [1]	108,635	291,959	1,116,918	1,737,428	2,357,938	2,978,448
% saving from Stormwater harvesting system		4%	5%	5%	5%	5%
Total saving from Turf removal and Stormwater harvesting system in gal	3,488,641	7,236,773	24,103,368	37,494,128	50,884,888	64,275,648
Gallon/Acre-foot conversion factor [2]						
Increased water savings due to updated programs in gal (compared to 2019)			20,614,727	34,005,487	47,396,247	60,787,007
Total Emissions from Water sector ($MTCO_2e$)	39,000		31,000	8,000	4,000	-
Total Water Use (Acre-Feet)			92,851	94,937	97,047	98,056
Total Water Use (Acre-Feet)			30,255,630,994	30,935,357,074	31,622,903,588	31,951,687,680
Emissions/gal ($MTCO_2e$/gal)			0.0000010	0.0000003	0.0000001	-
Emissions reduced by updating Waterscape Rebate Program ($MTCO_2e$)			**21**	**9**	**6**	**0**

[1] Data provided by County on March 14, 2023 (see below)
[2] Convertunits.com
[3] Assuming that updated waterscape rebate program is to be implemented from 2025

W-3.1

Increase wastewater treatment efficiency through the East County Advanced Water Purification Program to produce 12,900 acre feet of water each year by 2030.

ECAWP Energy Consumption		**2030**	**2035**	**2040**	**2045**
Wastewater/Water Recycling/Solids Handling (kWh) [1]	44,000,000				
Dechlorination facility (kWh) [1]	100,000				
Pump Stations (kWh) [1]	6,000,000				
Total Annual Electricity Consumption (kWh)	50,100,000				
Total Annual ElectricityConsumption (MWh)	50,100				
County specific Electricity Emission Factor ($MTCO_2e/MWh$)		0.0036	0.0004	0.0001	0.0000
Emissions from electricity use ($MTCO_2e$)		182	22	6	-
Annual Water Production (AF) [1]	12,900				
Reduced imported water supply due to Advanced Water Purification Program (AF)	12,900				
Annual Water Production (million gal) [1]	4,203				
Reduced imported water supply due to Advanced Water Purification Program (milli	4,203				
Avoided GHG emissions from the avoided imported water supply					
Upstream energy intensity (kWh/AF)	1,946				
Local distribution energy intensity (kWh/AF)	139				
Upstream energy use avoided from reduced imported water supply (MWh)	25,103				
Local distribution energy use avoided from reduced imported water supply (MWh)	1,793				
Electricity Emission Factor ($MTCO_2e/MWh$)					
Upstream (California Statewide Average)		0.17	0.04	0.02	-
Local Grid Supply		0.17	0.04	0.02	-
Avoided emissions from reduced imported water supply ($MTCO_2e$)					
Upstream		4,179	1,048	524	-
Local Grid supply		4,179	1,048	524	-
Total		8,358	2,095	1,048	-
Avoided wastewater treatment GHG emissions					
Wastewater Treatment Weighted Emission Factor* ($MTCO_2e$/million gallon) [2]	0.44				
Avoided wastewater treatment emissions from reduced imported water supply ($MtCO_2e$)		1,869	1,869	1,869	1,869
Net emissions reduction ($MTCO_2e$)		**10,046**	**3,942**	**2,911**	**1,869**

[1] Data from email sent by the County (Meghan Kelly) to Ascent on 6/23/2023
[2] Emission factor is calculated based on proportion of water treated at Point Loma Wastewater Treatment Plant, San Luis Rey Wastewater Treatment Plant, and Encina Water Pollution Control Facility and emisson factors at these facilities.

Sector	Strategy	Measure	ID	Action	GHG Reductions by Action ($MTCO_2e$)			
					2030	2035	2040	2045
Agriculture and Conservation	Preserve Natural Lands and Improve Land Management Practices to Protect Habitat and Increase Carbon Storage	A-1: Acquire and manage conservation lands to preserve natural lands and maximize carbon storage potential in the unincorporated area	A-1.1	Acquire 11,000 acres of conservation lands by 2030 and 1,000 acres per year thereafter to preserve land in perpetuity.	63,242	71,968	81,291	91,218
			A-1.2	Develop a Habitat Restoration Resource Management Framework for County-owned land by 2030 and restore 80 acres per year thereafter to increase carbon storage.	76	459	841	1,223
		A-2: Develop a tree planting program that expands canopy across the unincorporated area and prioritizes underserved communities	A-2.1	Expand the County's existing tree planting initiative and implement an Equity Driven Tree Planting Program to plant 70,560 trees by 2030 and 6,650 trees per year thereafter on County property and in the unincorporated area.	2,498	3,675	4,852	6,029
			A-2.2	Implement the County's Landscaping Ordinance to require tree planting in new single family residential development in the unincorporated area.	439	601	674	747
	Support Climate-Friendly Farming Practices and Preserve Agricultural Land	A-3: Preserve agricultural lands to prioritize carbon storage and balance economic and development goals	A-3.1	Implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 6,058 acres of agricultural land by 2030 and 400 acres per year thereafter.	9,699	12,210	14,736	17,327
		A-4: Incentivize carbon farming to expand carbon storage capacity on agricultural land and support climate-friendly farming practices in the unincorporated area	A-4.1	Develop a Carbon Farming Program by 2026 to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.	10,758	47,691	84,623	121,556
		A-5 : Reduce greenhouse gas emissions from agricultural operations	A-5.1	Develop a program by 2026 to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.	1,559	8,987	14,465	19,638
				Total	***88,271***	***145,590***	***201,482***	***257,739***

A-1.1

Acquire 11,000 acres of conservation lands by 2030 and 1,000 acres per year thereafter to preserve land in perpetuity.

		2030	2035	2040	2045
Historic conservation acreages over the past 10 years (2013-2022) (Acre) [1]	8,898.60				
Retired Dwelling Units (DUs) due to historic conservation acreages over the past 10 years (2013-2022) [1]	1,000.68				
Ratio of acres conserved to DUs retired (Acre:DU)	0.11				
Acres of Easements assumed, total, 2019 to 2030 (Acres)	11,000.00				
Acres of Easements assumed, per year, 2031 to 2050 (Acres) [3]	700.00				
Historic conservation acreages, 2015-2019 [1]	4,062.94				
Historic retired DUs, 2015-2019 [1]	708.39				
Acres of Easements relative to 2019 (Acres)		11,000	14,500	18,000	21,500
No. of DUs avoided relative to 2015 (historic retired DUs, 2015-19 + estimated DUs avoided, relative to 2019)		1,945	2,339	2,733	3,126
Emissions avoided by extinguishing DUs ($MTCO_2e$) [2]					
Construction		17,528	20,630	23,746	26,947
Operations					
Mobile		38,947	43,201	48,038	53,395
Area		2,957	3,555	4,153	4,752
Energy					
Electricity		43	51	60	69
Natural Gas		2,957	3,555	4,153	4,752
Water		410	494	577	660
Waste		401	482	563	644
Total emissions ($MTCO_2e$)		**63,242**	**71,968**	**81,291**	**91,218**
Total Emissions avoided by extinguishing DUs ($MTCO_2e$)		**63,242**	**71,968**	**81,291**	**91,218**

[1] Conservation acreages data (broken down by County Preserve, Parcel Acreage, and retired DUs) provided by County (Claire Moss) to Ascent on June 23, 2023.

[2] Scaled from modeling results from CalEEMod Version 2022.1 for 100 single family homes using a rural setting in San Diego county.

[3] Data provided by County during measure review (comment by Meghan Kelly)

A-1.2
Develop a Habitat Restoration Resource Management Framework for County-owned land by 2030 and restore 80 acres per year thereafter to increase

Acres restored per year beginning in 2030 [1]	80
Start year	2030

	2030	2035	2040	2045
Acres restored by target year	80	480	880	1,280

Class of Conservation Practice (COMET-Planner) [2]	Conservation Practice Standard (CPS)	Conservation Practice Implementation	MTCO$_2$e sequestered per year			
			2030	2035	2040	2045
Restoration of Disturbed Lands	Critical Area Planting (CPS 342)	Restore Highly Disturbed Areas by Planting Permanent Vegetative Cover	42	252	462	671
	Land Reclamation - Abandoned Mined Land (CPS 543)	Restoring Abandoned Mine Lands by Planting Permanent Vegetative Cover	-	-	-	-
	Land Reclamation - Currently Mined Land (CPS 544)	Restoring Currently Mined Lands by Planting Permanent Vegetative Cover	-	-	-	-
	Land Reclamation - Landslide Treatment (CPS 453)	Restoring Land Slide Areas by Planting Permanent Vegetative Cover	15	87	160	233
	Riparian Restoration	Restore Degraded Riparian Areas by Planting Woody Plants	20	120	219	319
Total carbon sequestered per year (MTCO$_2$e)			**76**	**459**	**841**	**1,223**

[1] Acreage data provided by County.
[2] COMET Planner (http://comet-planner.com/)

Approximate Carbon Sequestration and Greenhouse Gas Emission Reductions Associated with Selected Conservation Practices

Practice	Quantity (acres)	CO_2 (MTCO$_2$e/yr)	N_2O (MTCO$_2$e/yr)	CH_4 (MTCO$_2$e/yr)	MTCO$_2$e/yr	Proportion (Input)
Restore Highly Disturbed Areas by Planting Permanent Vegetative Cover	1,000	1,049	-	-	1,049	50%
Restoring Abandoned Mine Lands by Planting Permanent Vegetative Cover	1,000	1,049	-	-	1,049	0%
Restoring Currently Mined Lands by Planting Permanent Vegetative Cover	1,000	1,049	-	-	1,049	0%
Restoring Land Slide Areas by Planting Permanent Vegetative Cover	1,000	729	-	-	729	25%
Restore Degraded Riparian Areas by Planting Woody Plants	1,000	996	-	-	996	25%
					All practices must add up to 100%	100%

A-2.1

Expand the County's existing tree planting initiative and implement an Equity Driven Tree Planting Program to plant 70,560 trees by 2030 and 6,650 trees per year thereafter on County property and in the unincorporated area.

		2015	2019	2020	2025	2030	2035	2040	2045
Number of trees planted per year from 2015 to 2025 [1]	3,731								
Total number of Trees to be planted per year from 2025 onwards on County property and private property	6,650								
Total number of trees planted		3,731	14,924	18,655	37,310	70,560	103,810	137,060	170,310
Default Annual CO_2 accumulation per tree for Miscellaneous Trees ($MTCO_2e$/tree/year) [2]	0.0354								
Annual Sequestration from Planted Trees ($MTCO_2e$/year)						**2,498**	**3,675**	**4,852**	**6,029**
Trees planted per year after 2030							6,650	6,650	6,650

[1] Per County, achieved average of 3,731 trees and median of 3,661 trees per year 2015-2021 on DPR property. Assuming this continues through 2025.
[2] Source: Appendix A of CalEEMod Version 2020.4.0
[3] Data provided to Ascent by County staff on May 31, 2023.

A-2.2

Implement the County’s Landscaping Ordinance to require tree planting in new single family residential development in the unincorporated area.

		2019	**2020**	**2021**	**2025**	**2030**	**2035**	**2040**	**2045**
Forecasted Modified Number of Single Family Residences in Unincorporated County		145,287	145,907	146,527	149,821	152,108	154,394	155,429	156,464
Number of New Single Family Residences starting in 2020						6,201	8,487	9,522	10,557
Trees planted per new Single Family Residence						2	2	2	2
Total trees planted in New Single Family Residences						12,402	16,974	19,044	21,114
Default Annual CO_2 accumulation per tree for Miscellaneous Trees ($MTCO_2e$/tree/year) [1]	0.0354								
Annual Sequestration from Planted Trees ($MTCO_2e$/year)						439	601	674	747
Total GHG Reductions ($MTCO_2e$)						**439**	**601**	**674**	**747**

[1] From Appendix A of CalEEMod Version 2020.4.0

A-3.1
Implement the Purchase of Agricultural Conservation Easement (PACE) Program to preserve 6,058 acres of agricultural land by 2030 and 400 acres per year thereafter.

		2030	2035	2040	2045
Total land purchased under the PACE program (acres) from Fiscal Year 2013-14 to 2022-23 [1]	3,316				
DUs extinguished [1]	163.29				
DU avoided factor for the purchased land (DU/Acre) [1]	0.0492				
Land purchased 2015-2019 [1]	1,185				
Land to be purchased from 2019 to 2030 (acres)	4,873				
Agricultural land preserved by 2030	6,058				
Land to be purchased from 2031 to 2050 per year (acres)	400				
Land purchased since 2015 (acres)	1,185	6,058	8,058	10,058	12,058
DU's offset		298	397	495	594
Emissions avoided ($MTCO_2e$) [2]					
Construction		2,688	3,500	4,304	5,119
Operations					
Mobile		5,973	7,329	8,708	10,143
Area		453	603	753	903
Energy					
Electricity		7	9	11	13
Natural Gas		453	603	753	903
Water		63	84	105	125
Waste		61	82	102	122
Total emissions ($MTCO_2e$)		9,699	12,210	14,736	17,327
Total emissions avoided ($MTCO_2e$)		**9,699**	**12,210**	**14,736**	**17,327**

[1] Data provided by County (Claire Moss) to Ascent on PACE easement acquisitions by fiscal year (FY2013/14 through FY2022/23) and calendar year (2013 through March 29, 2023) on February 7, 2023, and June 13, 2023. Data provided: number of PACE easements, total acres acquired, number of DUs extinguished by year.
[2] Scaled from modeling results from CalEEMod Version 2022.1 for 100 single family homes using a rural setting for San Diego county. Modeling conducted separately for different target years.

A-4.1
Develop a Carbon Farming Program by 2026 to increase carbon sequestration on 3,000 acres by 2030 and 36,214 acres by 2045.

Carbon Farming Practice [1]	Type of land [3]	COMET Planner agricultural system type [1]	Acreage on which practice can be implemented [3] (2030)	$MTCO_2e$ sequestered per year [2]	Acreage on which practice can be implemented [3] (2045)	$MTCO_2e$ sequestered per year [2]
Compost	Crops (Slope <25%)	Cropland	1,000	3,164	8,554	27,061
Compost and Nutrient management (0% synthetic fertilizer use)	Crops (Slope <25%)	Cropland	1,000	3,176	8,554	27,163
Compost	Rangeland/grassland/ pasture (Slope <25%)	Grazing Land	1,000	4,419	15,167	67,024
Riparian restoration	Wetlands (on crop land and range/ pasture)	Cropland	-	-	480	209
Hedgerows	Nursery/ornamental	Cropland	-	-	3,460	98
Total carbon sequestered per year ($MTCO_2e$)			**3,000**	**10,758**	**36,214**	**121,556**

Conversions:

1 acre =	43,560	square feet	3,460 acre =	150,698,003	square feet
Length of side (feet)	209		Length of side (feet)	12,276	
Perimeter of 1 acre land (linear feet)	835		Perimeter (linear feet)	49,104	
Perimeter of 3,460 1 acre parcels (linear feet)	2,888,175				
Linear ft to acres factor (Acres/Linear ft) [3]	0.229				

Assuming the width of hedgerows is 10 feet. A hedgerow that is at least 10 feet wide (20 feet long) is a minimum size so it can incorporate several rows of plants to be effective. Source: Tenth Acre Farm, 2023. How to Plant a Hedgerow in the Home Landscape. Available: https://www.tenthacrefarm.com/how-to-plant-a-hedgerow/#:~:text=If%20you%20can%20swing%20it%2C%20a%20hedgerow%20that,plantings%20along%20a%20property%20line%20can%20do%20wonders.
[1] Practice and associated acreage data provided by County.
[2] COMET Planner (http://comet-planner-cdfahsp.com/) - see notes below for details
[3] https://www.inchcalculator.com/acreage-calculator/
[3] Data provided by County

A-5.1

Develop a program by 2026 to incentivize a transition to cleaner fuels and the efficient use of energy to reduce agricultural operations emissions in the unincorporated area.

		2019	2025	2030	2035	2040	2045
Agricultural Land (Acres) in unincorporated county		114,746	114,746	112,385	110,023	109,578	109,132
GHG Emissions from Agriculture Equipment (except irrigation pumps)		66,144	63,269	61,164	59,214	57,297	55,515
Diesel consumed in Agriculture Equipment (except irrigation pumps) in SD Region (gal)				6,555,384	6,330,316	6,121,236	5,927,000
Gasoline consumed in Agriculture Equipment (except irrigation pumps) in SD Region (gal)				238,913	235,806	232,950	230,328
Ratio of Agriculture Land Acreage - Unincorporated County to San Diego Region	88%						
Diesel consumed in Agriculture Equipment (except irrigation pumps) in unincorporated SD County (gal)				5,768,738	5,570,678	5,386,687	5,215,760
Gasoline consumed in Agriculture Equipment (except irrigation pumps) in unincorporated SD County (gal)				210,243	207,509	204,996	202,689
Diesel Ag equipment population in San Diego Region				4,504	4,355	4,216	4,086
Gasoline Ag equipment population in San Diego Region				618	605	593	581
Diesel Ag equipment population in unincorporated San Diego County				3,964	3,832	3,710	3,596
Gasoline Ag equipment population in unincorporated San Diego County				544	532	521	512
Incentives to switch to Tier 4 equipment (except irrigation pumps)							
Percent of Existing Farm Equipment that could feasibly switch to Tier 4				2.5%	7.5%	10.0%	15.0%
Average Fuel Economy Savings by Switching from Tier 2 to Tier 4 Final [1]	2.5%						
Number of Diesel Ag equipment that could feasibly switch to Tier 4				99	287	371	539
Number of Gasoline Ag equipment that could feasibly switch to Tier 4				14	40	52	77
Emissions reduced from Existing Farm Equipment switching to Tier 4 Final ($MTCO_2e$)				38	111	143	208
Transition to electric equipment (except irrigation pumps)							
Percent of existing and new farm equipment that could feasibly transition to electric equipment [4]				2.5%	15%	25%	35%
Number of Diesel Ag equipment that could feasibly switch to electric equipment				99	575	927	1,259
Number of Gasoline Ag equipment that could feasibly switch to electric equipment				14	80	130	179
Emissions reduced from transition to electric equipment ($MTCO_2e$)				1,529	8,882	14,324	19,430
Emissions from increased electric load by transitioning Ag equipments to electric (except irrigation pumps)							
Diesel saved by transition to Agriculture Equipment (except irrigation pumps) (gal)				144,218	835,602	1,346,672	1,825,516
Gasoline saved by transition to Agriculture Equipment (except irrigation pumps) (gal)				5,256	31,126	51,249	70,941
Assumed average efficiency of diesel engines [2]				40%	40%	40%	40%
Assumed average efficiency of gasoline engines [5]				33%	33%	33%	33%
Assumed average efficiency of electric heating [3]				100%	100%	100%	100%
Electricity consumed (MWh)				2,410	13,974	22,533	30,563
Electricity Emission Factor ($MTCO_2e$/MWh)				0.0036	0.0004	0.0001	-
Emissions from electricity use ($MTCO_2e$)				9	6	3	-
Agricultural Equipment Emissions ($MTCO_2e$)				61,164	59,214	57,297	55,515
Net Emissions Reduction from Measure A-6.2				**1,559**	**8,987**	**14,465**	**19,638**
% reduction				3%	15%	25%	35%
units transitioned				225	982	1,481	2,054

[1] For engines >751 HP, Tier 4 Final fuel efficiency is improved by up to 5 percent over Tier 2 engines.(https://www.cummins.com/engines/tier-4-final-1). CAT states a 5 reduction over Tier 4 interim

[2] General Power. 2022. Diesel Generator vs. Gas Generator: Which is More Efficient? Available at https://www.genpowerusa.com/blog/diesel-generator-vs-gas-generator-which-is-more-efficient/#:~:text=Diesel%20generators%20introduce%20and%20compress,percent%20of%20total%20load%20capacity.
[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-
[4] California Executive Order N-79-20 (sets a goal to transition off-road vehicles and equipment operations to 100 percent zero-emission by 2035 where feasible).
[5] ottovonschirach, 2021. What is the efficiency of gasoline engine? Available at https://ottovonschirach.com/what-is-the-efficiency-of-gasoline-engine/
[6] Alternative Fuels Data Center, 2021. Fuel Properties Comparison (https://afdc.energy.gov/files/u/publication/fuel_comparison_chart.pdf)

Sector	Strategy	Measure	ID	Action	GHG Reductions by Action ($MTCO_2e$)			
					2030	2035	2040	2045
Energy	Increase Building Energy Efficiency, Renewable Energy, and Electrification in the Unincorporated Area and County Operations	E-1: Develop policies and programs to increase energy efficiency, renewable energy use, and electrification in County Operations	E-1.1	Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.	13,715	14,698	16,135	16,858
		E-2: Develop policies and programs to increase energy efficiency and electrification in the unincorporated area	E-2.1	Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric equipment in new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.	17,734	39,512	59,394	80,358
			E-2.2	Increase energy efficiency and reach 30% electrification in residential and 17% electrification in non-residential existing development in the unincorporated area by 2030 by: -Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar energy efficiency requirements for existing development projects with qualifying improvements. -Adopting a Building Energy Performance Standard by 2026 for commercial and multi-family residential properties. -Developing a program by 2026 to incentivize building electrification and energy efficiency.	124,742	209,086	292,283	439,082
		E-3: Develop policies and programs to increase renewable energy use, generation, and storage in the unincorporated area	E-3.1	Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.	252	69	28	-
			E-3.2	Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.	29	5	2	-
			E-3.3	Develop a program to provide 100% renewable energy to residents and businesses participating in San Diego Community Power by 2030 in the unincorporated area.	176,625	33,948	18,925	-
				Total	***333,097***	***297,319***	***386,766***	***536,299***

E-1.1

Implement the County Facilities Zero Carbon Portfolio Plan to achieve 90% reduction in operational carbon emissions by 2030 through building electrification and zero net energy construction, energy efficiency, energy management, and renewable energy use and generation.

Reductions from natural gas phase out		**2019**	**2030**	**2035**	**2040**	**2045**
Forecasted natural gas usage in buildings and facilities (therms)		2,461,283	2,610,863	2,678,853	2,746,844	2,814,835
Natural gas usage in existing buildings and facilities (therms)		2,461,283	2,461,283	2,461,283	2,461,283	2,461,283
Target electrification rate [1]			93%	95%	100%	100%
Reduced natural gas use (therms)			2,428,102	2,544,911	2,746,844	2,814,835
Natural gas emissions factor ($MTCO_2e$/therm)			5.32E-03	5.32E-03	5.32E-03	5.32E-03
GHG reductions from natural gas savings in existing buildings and facilities ($MTCO_2e$)			12,919	13,541	14,615	14,977
Natural gas use in new buildings and facilities (therms)			149,580	217,570	285,561	353,552
Target electrification rate [4]			100%	100%	100%	100%
Reduced natural gas use (therms)			149,580	217,570	285,561	353,552
Natural gas emissions factor ($MTCO_2e$/therm)			5.32E-03	5.32E-03	5.32E-03	5.32E-03
GHG reductions from natural gas savings in new buildings and facilities ($MTCO_2e$)			796	1,158	1,519	1,881
Total GHG reductions from natural gas savings in buildings and facilities (MTCO2e)			**13,715**	**14,698**	**16,135**	**16,858**
Additional electricity use and emissions						
Assumed average efficiency of natural gas heating [2] [3]			78%	78%	78%	78%
Assumed average efficiency of electric heating [4]			100%	100%	100%	100%
MWh per therm conversion	0.029					
Total therms offset due to electrification (therms)			2,577,682	2,762,481	3,032,405	3,168,386
Total electricity needed to offset natural gas (MWh)			58,307	62,487	68,593	71,669
Local Government Electricity Emission Factor ($MTCO_2e$/MWh)			0.00	0.00	0.00	0.00
Total GHG emissions from electricity use ($MTCO_2e$)			-	-	-	-
Potential for Reductions from ZNE construction						
Forecasted electricity use in buildings and facilities (MWh)		113,285	124,603	129,744	134,886	140,027
Electricity use in existing facilities (MWh)			113,285	113,285	113,285	113,285
Forecasted growth in electricity use (relative to 2019) (MWh)			11,318	16,458	21,600	26,742
Additional electricity use from elimination of natural gas in new buildings and facilities (MWh)			58,307	62,487	68,593	71,669
Total electricity use that could be reduced through ZNE construction (EE + renewables)			69,625	78,946	90,193	98,411
Emissions Reductions ($MTCO_2e$)			**13,715**	**14,698**	**16,135**	**16,858**

Sources:

[1] Target electrification rates adjusted to achieve 90% reduction in operational carbon emissions by 2030
[2] https://www.energy.gov/sites/prod/files/2014/05/f15/fupwg_may2014_new_gas_technologies.pdf
[3] https://www.aceee.org/sites/default/files/publications/researchreports/a1602.pdf
[4] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-

E-2.1
Amend the County's Code of Regulatory Ordinances by 2026 to require all-electric equipment in new residential, commercial, and industrial construction to reduce energy emissions from new development in the unincorporated area.

	2019	2025	2030	2035	2040	2045
Fuel switching from natural gas						
Forecasted natural gas usage in the unincorporated county (therms)	86,039,213	94,000,000	97,300,000	101,200,000	104,500,000	107,900,000
Natural gas use in existing land uses (as of 2025) (therms)			94,000,000	94,000,000	94,000,000	94,000,000
Anticipated growth in natural gas use in unincorporated county (therms)			3,300,000	7,200,000	10,500,000	13,900,000
Estimated growth in residential natural gas use (therms)			1,378,992	3,008,709	4,387,701	5,808,481
Target electrification rate for new residential development			100%	100%	100%	100%
Estimated growth in non-residential natural gas use (therms)			1,921,008	4,191,291	6,112,299	8,091,519
Target electrification rate for new non-residential development			80%	85%	90%	95%
Reduced natural gas usage in new residential development (therms)			1,378,992	3,008,709	4,387,701	5,808,481
Reduced natural gas usage in new non-residential development (therms)			1,536,807	3,562,597	5,501,069	7,686,943
Remaining natural gas therms from new development			384,202	628,694	611,230	404,576
Natural gas emissions factor ($MTCO_2e$/therm)			0.00545	0.00545	0.00545	0.00545
GHG reductions from natural gas savings from new development ($MTCO_2e$)			15,891	35,814	53,894	73,550
Additional electricity use and emissions						
Assumed average efficiency of natural gas heating [1] [2]		78%	78%	78%	78%	78%
Assumed average efficiency of electric heating [3]		100%	100%	100%	100%	100%
MWh per therm conversion		0.029				
Total therms offset from natural gas heating use (therms)			2,915,798	6,571,306	9,888,770	13,495,424
Total electricity needed to offset natural gas (MWh)			65,955	148,643	223,684	305,266
Electricity Emission Factor ($MTCO_2e$/MWh)			0.0036	0.0004	0.0001	0.0000
Total GHG emissions from electricity use by reducing natural gas use ($MTCO_2e$)			239	66	27	-
Fuel switching from propane						
Forecasted propane usage in the unincorporated county (gal)	20,872,121	21,500,000	21,900,000	22,200,000	22,500,000	22,700,000
Propane use in existing land uses (as of 2025) (gal)			21,500,000	21,500,000	21,500,000	21,500,000
Estimated growth in propane use in unincorporated county (gal)			400,000	700,000	1,000,000	1,200,000
Target electrification rate			90.0%	92.5%	95.0%	97.5%
Reduced propane usage (gal)			360,000	647,500	950,000	1,170,000
Remaining propane usage from new development			40,000	52,500	50,000	30,000
Propane emissions factor ($MTCO_2e$/gal)			0.01	0.01	0.01	0.01
GHG reductions from propane savings from new development ($MTCO_2e$)			2,095	3,768	5,528	6,808
Assumed average efficiency of propane [4] [5] [6]			36%	36%	36%	36%
Assumed average efficiency of electric heating [3]			100%	100%	100%	100%
MWh per gal conversion		0.028				
Total gal offset from propane heating use (gal)			360,000	647,500	950,000	1,170,000
Total electricity needed to offset propane (MWh)			3,627	6,524	9,572	11,789
Electricity Emission Factor ($MTCO_2e$/MWh)			0.0036	0.0004	0.0001	0.0000
Total GHG emissions from electricity use Offsetting propane use ($MTCO_2e$)			13.14	2.90	1.13	-
Emissions Reductions ($MTCO_2e$)			**17,734**	**39,512**	**59,394**	**80,358**
Energy-related emissions (leg-adjusted) ($MTCO_2e$)			860,000	719,000	721,000	720,000
% reduction			2%	5%	8%	11%

Assumption
LPG generators have the same power and performance as petrol generators [5]. Diesel (40% efficiency [4])contains about 10% more energy by volume than petrol [6].

Sources: 0%

[1] https://www.energy.gov/sites/prod/files/2014/05/f15/fupwg_may2014_new_gas_technologies.pdf
[2] https://www.aceee.org/sites/default/files/publications/researchreports/a1602.pdf
[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-
[4] General Power. 2022. Diesel Generator vs. Gas Generator: Which is More Efficient? Available at https://www.genpowerusa.com/blog/diesel-generator-vs-gas-generator-which-is-more-efficient/#:~:text=Diesel%20generators%20introduce%20and%20compress,percent%20of%20total%20load%20capacity.
[5] FloGas. 2022. Comparable Portable Generators. Available at: https://www.bing.com/search?q=lpg+generator+efficiency&cvid=53f86bab04b548cdba264f22f2b12bcc&aqs=edge.0.0j69i64j69i11004.7717j0j4&FORM=ANAB01&PC=U531
[6]Business Today. 2018. Generator Fuel Efficiency: What You Need to Know. Available at https://businesstoday.co.ke/generator-fuel-efficiency-need-know/

E-2.2

Increase energy efficiency and reach 30% electrification in residential and 17% electrification in non-residential existing development in the unincorporated area by 2030 by:
-Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CALGreen or similar energy efficiency requirements for existing development projects with qualifying improvements.
-Adopting a Building Energy Performance Standard by 2026 for commercial and multi-family residential properties.
-Developing a program by 2026 to incentivize building electrification and energy efficiency.

	2019	2025	2030	2035	2040	2045
Fuel switching from natural gas in existing residential buildings						
Existing natural gas usage in residential buildings (therms)	35,953,748	35,953,748	35,953,748	35,953,748	35,953,748	35,953,748
Annual building electrification rate (per year) [1]						
Target electrification rate for existing residential buildings [1]			30%	50%	70%	90%
Number of housing units captured			50,940	84,900	118,859	152,819
Reduced residential natural gas usage (therms)			10,786,124	17,976,874	25,167,624	32,358,373
Natural gas emissions factor ($MTCO_2e$/therm)			0.00545	0.00545	0.00545	0.00545
GHG reductions from natural gas to electric fuel switching - existing residential buildings ($MTCO_2e$/year)			58,784	97,974	137,164	176,353
Fuel switching from natural gas in existing non-residential buildings						
Existing natural gas usage in non-residential buildings (therms)	50,085,465	50,085,465	50,085,465	50,085,465	50,085,465	50,085,465
Annual building electrification rate (per year) [1]						
Target electrification rate for existing non-residential buildings [1]			17%	28%	39%	66%
Reduced non-residential natural gas usage (therms)			8,514,529	14,023,930	19,533,331	33,056,407
Natural gas emissions factor ($MTCO_2e$/therm)			0.00545	0.00545	0.00545	0.00545
GHG reductions from natural gas to electric fuel switching - existing non-residential buildings (MTCO2e/year)			46,404	76,430	106,457	180,157
Increased GHG emissions from natural gas to electric fuel switching - existing residential and non-residential buildings						
Assumed average efficiency of natural gas heating [2] [3]			78%	78%	78%	78%
Assumed average efficiency of electric heating [4]			100%	100%	100%	100%
MWh per therm conversion		0.029				
Total therms offset from natural gas use (therms)			19,300,653	32,000,804	44,700,955	65,414,780
Total electricity needed to offset natural gas (MWh)			436,581	723,858	1,011,136	1,479,682
Electricity Emission Factor ($MTCO_2e$/MWh)			0.0036	0.0004	0.0001	0.0000
GHG emissions increased from natural gas to electric fuel switching existing residential and non-residential buildings (MTCO2e/year)			1,582	322	120	-
Fuel switching from propane to electricity in existing residential and non-residential buildings						
Forecasted propane usage in the unincorporated county (gal)	20,872,121	21,500,000	21,900,000	22,200,000	22,500,000	22,700,000
Propane use in existing land uses (as of 2025) (gal)			21,500,000	21,500,000	21,500,000	21,500,000
Annual building electrification rate (per year) [1]						
Target electrification rate			17%	28%	39%	66%
Reduced propane usage (gal)			3,655,000	6,020,000	8,385,000	14,190,000
Remaining propane usage from existing development			17,845,000	15,480,000	13,115,000	7,310,000
Propane emissions factor ($MTCO_2e$/gal)			0.01	0.01	0.01	0.01
GHG reductions from propane to electric fuel switching - existing residential and non-residential buildings (MTCO2e/year)			21,268	35,030	48,792	82,572
Increased GHG emissions from propane to electric fuel switching - existing residential and non-residential buildings						
Assumed average efficiency of propane [4] [5] [6]			36%	36%	36%	36%
Assumed average efficiency of electric heating [3]			100%	100%	100%	100%
MWh per gal conversion		0.028				
Total gal offset from propane heating use (gal)			3655000	6020000	8385000	14190000
Total electricity needed to offset propane (MWh)			36,827	60,656	84,486	142,975
Electricity Emission Factor ($MTCO_2e$/MWh)			0.0036	0.0004	0.0001	0.0000
GHG emissions increased from propane to electric fuel switching existing residential and non-residential buildings (MTCO2e/year)			133.42	26.96	10.01	-
Emissions Reductions ($MTCO_2e$/year)			**124,742**	**209,086**	**292,283**	**439,082**

[1] Mozingo. 2021. Zero-Carbon Buildings in California: A Feasibility Study
[2] https://www.aceee.org/sites/default/files/publications/researchreports/a1602.pdf
[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-

E-3.1

Amend the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar renewable energy requirements for new residential and non-residential construction to increase renewable energy generation in new development.

	2030	2035	2040	2045
Increased electricity use after applying measure E-2.1 (MWh)	69,583	155,167	233,256	317,055
KWh to KW factor for San Diego, CA [1]				
MWh to MW factor for San Diego, CA				
Capacity of solar panels installed due to implementation of measure E-3.1 (MW)	43	97	146	198
Total emissions from increased electricity use after applying measure E-3.1 ($MTCO_2e$)	252	69	28	-
GHG emissions reduction ($MTCO_2e$)	**252**	**69**	**28**	**-**

Estimated reductions are beyond the 2022 Title 24 code and CALGreen which currently require solar to cover electricity in a home with no electric water heater or stove
Under current code, solar PV system must be sized to provide for full annual energy usage of mixed-fuel home; size calculation does not include furnace, water heater, stove, dryer
E-2.1 estimates the increased electricity demand from electrification of natural gas uses in new development

[1] Average annual kW converted to average annual kWh using NREL's PVWatts Calculator using "San Diego county" as the address.

E-3.2

Expand and implement the County's streamlined solar permitting process to install 5,002 kW of renewable energy on existing development by 2030 and 12,505 kW by 2045.

		2030	2035	2040	2045
Average sq ft of development with solar installation in last 5 years (2018 to 2022) (sq ft per year) [1]	1,257				
Average number of permits issued in last 5 years (2018 to 2022) [1]	6,863				
Average annual kW solar installed in last 5 years (2018 to 2022) [1]	50,022				
Average electricity generation through permits issued annually (kWh) [2]	80,061,811				
Conversion to MWh	80,062				
Increase in KWh generation with expanded program compared to last 5 years average (%)		10%	15%	20%	25%
Increase in number of permits under expanded program (avg per year)		686	1,029	1,373	1,716
Electricity generation with updated program (kWh)		88,067,993	92,071,083	96,074,174	100,077,264
Electricity generation with updated program (MWh)		88,068	92,071	96,074	100,077
Increased solar generation due to updated program (MWh)		8,006	12,009	16,012	20,015
Increased solar generation due to updated program (kWh)		8,006,181	12,009,272	16,012,362	20,015,453
Electricity emissions factor (MTCO2e/MWh)		0.0036	0.0004	0.0001	0.0000
Emissions reduced from expanded solar permitting process (MTCO2e)		**29**	**5**	**2**	**-**
Increased solar installed (kW)		5,002	7,503	10,004	12,505
Average number of solar permits per year after implementation of the measure		7,550	7,893	8,236	8,579

[1] Data provided by County (Claire Moss) to Ascent on March 29, 2023
[2] Average annual kW converted to average annual kWh using NREL's PVWatts Calculator using "San Diego county" as the address.
[3] Unincorporated County of San Diego 2019 Greenhouse Gas Emissions Inventory and Projections

E-3.3

Develop a program to provide 100% renewable energy to residents and businesses participating in San Diego Community Power by 2030 in the uninc

		2019	2030	2035	2040	2045
Electricity use in unincorporated county (GWh)		1,830	2,520	2,591	2,667	2,744
Reductions from other measures (MWh)	*E-3.2*		8,006	12,009	16,012	20,015
Remaining demand (GWh)			2,512	2,579	2,651	2,724
Total Forecasted Demand in unincorporated county (GWh)			2,512	2,579	2,651	2,724
Participation rate in 100% renewable option			95.1%	96.7%	98.4%	100.0%
Electricity emissions factor ($MTCO_2e$/MWh) (from CAP Appendix 3)			0.074	0.014	0.007	-
Emissions from electricity demand ($MTCO_2e$)			185,726	35,094	19,239	-
GHG Reductions from increased participation in SDCP 100% option ($MTCO_2e$)			**176,625**	**33,948**	**18,925**	**-**
Electricity emissions factor ($MTCO_2e$/MWh) with increased participation in SDCP 100% option			0.0036	0.0004	0.0001	-
Electricity emissions factor ($lbCO_2e$/MWh) with increased participation in SDCP 100% option			7.9870	0.9800	0.2613	-

Increased demand under E-2.1 is captured by increased renewables under E-3.1

Note: need to add demand from EVs once built environment and transportation measures are final

Sector	Strategy	Measure	ID	Action	GHG Reductions by Action ($MTCO_2e$)			
					2030	2035	2040	2045
Built Environment and Transportation	Decarbonize the On-Road and Off-Road Vehicle Fleet	T-1: Reduce fleet and small equipment emissions from County Operations	T-1.1	Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045.	7,900	9,772	10,234	13,250
			T-1.2	Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.	5	5	5	5
		T-2: Increase the use of low-carbon and zero-emission landscaping and off-road construction equipment in the unincorporated area	T-2.1	Develop a program by 2026 to provide residents and businesses incentives to purchase alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 3% by 2030.	2,072	3,762	7,773	-
			T-2.2	Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.	7,638	7,750	7,839	86,376
		T-3: Install electric vehicle charging stations and provide incentives for zero-emissions vehicles in the unincorporated area	T-3.1	Increase the use of electric and other zero-emission vehicles in the unincorporated area by: - Installing 2,040 publicly available electric vehicle charging stations by 2028. - Requiring the electrification of loading docks and idling reduction in new commercial and industrial development by 2030. - Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multi-family residential and non-residential construction. - Developing a program by 2026 to incentivize EV purchases and school bus electrification	218,884	232,645	270,436	297,184
	Support Active Transportation and Reduce Single-Occupancy Vehicle Trips	T-4: Reduce emissions from County employee commutes	T-4.1	Expand County Benefit Program by 2026 to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time teleworking options to reduce vehicle miles traveled from employee commutes by 40% in 2030 and 64% in 2045.	12,800	9,900	6,500	8,960
			T-4.2	Develop a rebate program by 2026 for County employees to purchase electric vehicles, bicycles, and scooters for commute use.	903	1,204	1,037	1,448
		T-5: Improve County roadways to encourage walking, biking, rolling to/from transit and destinations and increase transportation efficiency	T-5.1	Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the unincorporated area.	1,756	2,425	2,100	2,800
			T-5.2	Develop a countywide Safe Routes to Schools program to reduce vehicle miles traveled to schools by 1.2% by 2030.	214	144	82	82
		T-6: Support transit and transportation demand management to reduce single occupancy vehicle trips in the unincorporated area	T-6.1	Develop a program to provide free transit passes and/or free trips in the unincorporated area to reduce vehicle miles traveled in the unincorporated area by 1.2% by 2030.	3,051	2,396	1,582	2,146
			T-6.2	Increase access to Transit Priority Areas by 5% in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians by 2030.	12,615	19,709	19,444	35,198
			T-6.3	Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) to reduce vehicle miles traveled by 7% within the unincorporated area by 2030.	994	1,215	1,001	1,292
				Total	**268,831**	**290,927**	**328,033**	**448,742**

T-1.1

Implement the County's 2019 Electric Vehicle Roadmap and 2023 Green Fleet Action Plan to reduce fleet emissions 35% by 2030 and 100% by 2045.

		2019	2027	2030	2035	2040	2045
Replace Gasoline Vehicles with EVs							
County fleet emissions from on road gasoline vehicles with ACCII impact (MTCO$_2$e)		21,109		15,811	10,473	6,001	5,726
Gasoline vehicles replaced with EVs [3] [4] [7]			501	551	601	651	701
Weighted Gasoline emission factor (MTCO$_2$e/mile) [1]				0.000329	0.000307	0.000295	0.000288
Gasoline consumption per vehicle (gal/vehicle) [2]				521	493	475	465
Reduced Gasoline consumption by transition to EVs (gal)				286,917	296,009	309,388	325,798
Baseline and forecasted gasoline consumption in on-road vehicles (gal)		2,369,929		2,662,855	2,757,060	2,839,251	2,921,442
Remaining gasoline consumption after transition to EVs (gal)				2,375,938	2,461,051	2,529,863	2,595,643
Adjusted emissions from gasoline use in on-road vehicles (MTCO$_2$e)				14,107	9,349	5,347	5,087
Emission reduction due to transition to EVs (MTCO$_2$e)				1,704	1,124	654	639
Additional electric load due to transition to EVs							
Gal to MWh factor	27.32						
Electricity needed to offset reduced gasoline use (MWh) [2]				10,501	10,834	11,324	11,924
Electricity emissions factor (MTCO$_2$e/MWh)				0.0036	0.0004	0.0001	0.0000
Emissions from added electricity load (MTCO$_2$e)				38	5	1	-
Net emissions reductions from replacing gasoline vehicles with EVs (MTCO$_2$e)				1,666	1,120	653	639
Replace existing diesel and gasoline vehicles with more fuel efficient vehicles [5]							
Forecasted Emissions by Fuel from County Fleet Operations (MTCO2e)							
Emissions from Fuel: Gasoline (from on-road vehicles) after replacing gasoline vehicles with EVs				14,145	9,354	5,348	5,087
Emission from Fuel: Petroleum based Diesel				62	61	61	62
Emissions from Fuel: Renewable Diesel				6,574	6,808	7,087	7,462
Total emisions from fuel (Gasoline, Petroleum Diesel, Renewable Diesel)				20,781	16,223	12,497	12,612
Percent reduction in vehicle fleet emissions below future forecasts years [6]				30%	53%	77%	100%
Annual reduction in fleet emissions from forecast (MTCO2e)				6,234	8,652	9,581	12,612
Target fleet emissions after reduction (MTCO2e)				14,547	7,571	2,916	-
GHG Reductions from reducing County's Fleet Emissions (MTCO2e)				6,234	8,652	9,581	12,612
Total reductions (MTCO2e)				**7,900**	**9,772**	**10,234**	**13,250**
Forecasted Emissions by Fuel from County Fleet Operations [5]							
Emissions from Fuel: Electricity				4	1	0	-
Emissions from Fuel: Gasoline (from on-road vehicles)				15,811	10,473	6,001	5,726
Emissions from Fuel: Petroleum based Diesel				62	61	61	62
Emissions from Fuel: Renewable Diesel				6,574	6,808	7,087	7,462
Total forecasted emissions				22,450	17,343	13,150	13,250
Percent reduction				**35%**	**56%**	**78%**	**100%**

[1] Calculated using EMFAC, 2021, assuming County has the same vehicle mix as San Diego region
[2] Using county-wide Emission Factor from EPIC (Assumes EVs are not exclusively charged at County facilities)
[3] Per County's EV Roadmap and Green Fleet Action Plan, the calculation assumes 250 vehicles in 2025 and 251 vehicles in 2027 (a total of 501 by 2027) replaced with EVs
[4] Adding 50 Evs every 5 years from 2030 through 2050 as per discussion with the County in meeting dated 5/11/2023
[5] This measure addresses only on-road vehicles (and excludes aircraft and landscape eqipment)
[6] Data provided by County (Meghan Kelly) to Ascent via email on 6/26/2023
[7] Assumption: only gasoline vehicles would be replaced with EVs because 79.72% of fuel consumed for on road transportation is gasoline while only 0.12% petroleum based diesel is consumed by on road vehicles. Other fuel types used by in the County fleet are used of construction activities and aircraft.

County Regulatory ordinance related to measure T-1.1

H-1: If EV infrastructure is available at the site where an EV Capable vehicle is stationed and the EV Capable vehicle is at least 75% depreciated, that vehicle will be included in the annual list for vehicle replacement.

H-2: All vehicles purchased will be b) energy-efficient and low emissions within the vehicle class/type, e; d) meet the criteria of the County definition of Electric Vehicle (EV) Capable when available. DGS will use the County of San Diego Green Fleet Action Plan to assist departments in developing Five-Year Vehicle Replacement Plan

F-22: DGS may include provisions for potential electric vehicle charging stations in parking areas

T-1.2
Amend Board policy to require 100% of landscaping equipment used on County property to be zero-emissions by 2030.

	2019	2030	2035	2040	2045
Landscaping equipment emissions	4	5	5	5	5
Percent of equipment transitioned to zero-emissions		100%	100%	100%	100%
Emissions reduced from equipment transitioning to zero emission equipment ($MTCO_2e$)		**5**	**5**	**5**	**5**

T-2.1

Develop a program by 2026 to provide residents and businesses incentives to purchase alternative fuel and/or zero-emission construction and landscaping equipment to reduce emissions 3% by 2030.

		2019	2025	2030	2035	2040	2045
Diesel consumed in Construction Equipment in San Diego region (gal)				24,749,749	26,109,800	27,469,868	28,829,163
Gasoline consumed in Construction Equipment in San Diego region (gal)				765,682	776,225	787,640	787,081
Ratio of Construction Jobs - Unincorporated County to San Diego region (From EPIC's inventory report)	25%						
Diesel consumed in Construction Equipment in unincorporated county (gal)				6,187,437	6,527,450	6,867,467	7,207,291
Gasoline consumed in Construction Equipment in unincorporated county (gal)				191,420	194,056	196,910	196,770
Emissions from Construction and Mining equipment (MT CO_2e)		44,179	61,410	67,738	73,461	75,849	78,454
Emissions from existing construction and mining equipment (assuming implementation starts from 2026) ($MTCO_2e$)				61,410	61,410	61,410	61,410
Increase in emissions (beginning in 2026) ($MTCO_2e$)				6,328	12,051	14,439	17,044
Number of diesel fueled Construction Equipment in San Diego region				13,918	14,425	14,925	15,317
Number of gasoline fueled Construction Equipment in San Diego region				9,323	9,573	9,833	9,764
Number of diesel fueled Construction Equipment in unincorporated county				3,479	3,606	3,731	3,829
Number of gasoline fueled Construction Equipment in unincorporated county				2,331	2,393	2,458	2,441
Incentives to switch to Tier 4 equipment							
Percent of Existing Equipment that (because of the County Program) switch to Tier 4 Final [7]				3%	5%	10%	0%
Average Fuel Economy Savings by Switching from Tier 2 to Tier 4 Final [1]	2.5%						
Number of diesel fueled Construction Equipment in unincorporated San Diego county that switch to Tier 4 Final				104	180	373	
Number of gasoline fueled Construction Equipment in unincorporated San Diego county that switch to Tier 4 Final				70	120	246	
Emissions reduced from Existing Construction Equipment switching to Tier 4 Final ($MTCO_2e$)				51	92	190	
Transition to electric equipment							
Percent of existing and new equipment that (because of the T-2.1) transition to electric equipment [2]				3%	5%	10%	
Number of diesel fueled Construction Equipment in unincorporated San Diego county that can feasibly switch to electric				104	180	373	***Note: GHG reductions from construction equipment in 2045 are included in T-2.2***
Number of gasoline fueled Construction Equipment in unincorporated San Diego county that can feasibly switch to electric				70	120	246	
Emissions reduced from Transition of electric equipment ($MTCO_2e$)				2,032	3,673	7,585	
GHG Reductions from T-2.1 ($MTCO_2e$)				2,083	3,765	7,775	
Emissions from increased electric load by transitioning Construction equipment to electric							
Diesel saved by transitioned Construction Equipment (gal)				185,623	326,373	686,747	
Gasoline saved by transitioned Construction Equipment (gal)				5,743	9,703	19,691	
Assumed average efficiency of diesel engines [4]				40%	40%	40%	
Assumed average efficiency of gasoline engines [5]				33%	33%	33%	
Assumed average efficiency of electric heating [6]				100%	100%	100%	
Electricity consumed (MWh)				3,090	5,429	11,414	
Electricity Emission Factor ($MTCO_2e$/MWh)				0.0036	0.0004	0.0001	
Emissions from electricity use ($MTCO_2e$)				11	2	1	
Total emissions reductions from T-2.1				**2,072**	**3,762**	**7,773**	
units transitioned				**349**	**600**	**1,238**	
				3%			

[1] For engines >751 HP, Tier 4 Final fuel efficiency is improved by up to 5 percent over Tier 2 engines.(https://www.cummins.com/engines/tier-4-final-1). CAT states a 5 reduction over
[2] California Executive Order N-79-20 (sets a goal to transition off-road vehicles and equipment operations to 100 percent zero-emission by 2035 where feasible).
[3] 2020 MSS , page 34 (https://ww2.arb.ca.gov/sites/default/files/2021-12/2020_Mobile_Source_Strategy.pdf)
• Replace older and dirtier equipment with cleanest ones
by 2033
• Cleaner off-road engine emission standards in 2027
• Zero-emission and hybrid requirements in late 2020s
[4] General Power. 2022. Diesel Generator vs. Gas Generator: Which is More Efficient? Available at https://www.genpowerusa.com/blog/diesel-generator-vs-gas-generator-which-is-more-efficient/#:~:text=Diesel%20generators%20introduce%20and%20compress,percent%20of%20total%20load%20capacity.
[5] ottovonschirach, 2021. What is the efficiency of gasoline engine? Available at https://ottovonschirach.com/what-is-the-efficiency-of-gasoline-engine/
[6] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-
[7] Assuming 0% transition in 2045 because of the requirement for 100% electric construction equipment in T-2.3

T-2.2

Develop and adopt a landscaping equipment ordinance to require the use of zero emission landscaping equipment by 2030 and zero emission construction equipment by 2045 in the unincorporated area.

		2019	2025	2030	2035	2040	2045
Diesel consumed in Landscaping Equipment in San Diego region (gal)				189,303	202,330	216,701	216,673
Gasoline consumed in Landscaping Equipment in San Diego region (gal)				9,571,664	9,789,980	9,976,995	10,152,103
Ratio of Population - Unincorporated County to San Diego region	14%						
Diesel consumed in Landscaping Equipment in unincorporated county (gal)				26,502	28,326	30,338	30,334
Gasoline consumed in Landscaping Equipment in unincorporated county (gal)				1,340,033	1,370,597	1,396,779	1,421,294
Emissions from lawn and garden equipment ($MTCO_2e$)		7,233	7,631	7,697	7,757	7,841	7,922
Emissions from existing lawn and garden equipment (as of 2025) ($MTCO_2e$)				7,631	7,631	7,631	7,631
Emissions from new lawn and garden equipment ($MTCO_2e$)				66	126	210	291
Percent of equipment that transitions to zero emission equipment				100%	100%	100%	100%
Emissions reduced from transitioning to zero emission equipment ($MTCO_2e$)				7,697	7,757	7,841	7,922
Emissions from increased electric load by transitioning Landscaping equipment to electric							
Percent of equipment that could feasibly transition to zero emission equipment				100%	100%	100%	100%
Diesel saved by transitioned Landscaping Equipment (gal)				26,502	28,326	30,338	30,334
Gasoline saved by transitioned Landscaping Equipment (gal)				1,340,033	1,370,597	1,396,779	1,421,294
Assumed average efficiency of diesel engines [1]				40%	40%	40%	40%
Assumed average efficiency of gasoline engines [2]				33%	33%	33%	33%
Assumed average efficiency of electric heating [3]				100%	100%	100%	100%
Electricity consumed (MWh)				16,371	16,764	17,109	17,400
Electricity Emission Factor ($MTCO_2e/MWh$)				0.0036	0.0004	0.0001	0.0000
Emissions from electricity use ($MTCO_2e$)				59	7	2	-
Emissions from requiring use of zero emission construction equipment by 2045							
Transition to electric equipment							
Percent of existing and new equipment that (because of the County Program) transition to electric equipment [2]							100%
Number of diesel fueled Construction Equipment in unincorporated San Diego county that can feasibly switch to electric							3,829
Number of gasoline fueled Construction Equipment in unincorporated San Diego county that can feasibly switch to electric							2,441
Emissions reduced from Transition of electric equipment ($MTCO_2e$)							78,454
Emissions from increased electric load by transitioning Construction equipment to electric							
Diesel saved by transitioned Construction Equipment (gal)							7,207,291
Gasoline saved by transitioned Construction Equipment (gal)							196,770
Assumed average efficiency of diesel engines [4]							40%
Assumed average efficiency of gasoline engines [5]							33%
Assumed average efficiency of electric heating [6]							100%
Electricity consumed (MWh)							119,675
Electricity Emission Factor ($MTCO_2e/MWh$)							0.0000
Emissions from electricity use ($MTCO_2e$)							-
Total emissions reductions from T-2.3 ($MTCO_2e$)				**7,638**	**7,750**	**7,839**	**86,376**

Note: Prior to 2045, GHG reductions from construction equipment are calculated in T-2.1

Notes:
SORE sold in California on or after January 1, 2024 to be zero-emission. (https://calcattlemen.org/wp-content/uploads/2022/01/2022-CARB-SORE-Factsheet-Final-Final.pdf)
SORE refers to spark-ignition engines which are 25 horsepower or less. Most landscaping equipment come under this category
Implementation can include a combination of transition to electric and Tier 5 (available for application from 2028)

[1] General Power. 2022. Diesel Generator vs. Gas Generator: Which is More Efficient? Available at https://www.genpowerusa.com/blog/diesel-generator-vs-gas-generator-which-is-more-efficient/#:~:text=Diesel%20generators%20introduce%20and%20compress,percent%20of%20total%20load%20capacity.
[2] ottovonschirach, 2021. What is the efficiency of gasoline engine? Available at https://ottovonschirach.com/what-is-the-efficiency-of-gasoline-engine/
[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-

T-3.1

Increase the use of electric and other zero-emission vehicles in the unincorporated area by:
- Installing 2,040 publicly available electric vehicle charging stations by 2028.
- Requiring the electrification of loading docks and idling reduction in new commercial and industrial development by 2030.
- Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multi-family residential and non-residential construction.
- Developing a program by 2026 to incentivize EV purchases and school bus electrification

	2019	2030	2035	2040	2045
Ratio of Modified unincorporated San Diego County Population to San Diego Region population	0.145	0.141	0.139	0.137	0.136
Increase light duty EV/PHEV Population					
EV Forecasts and Targets					
EMFAC2021 ACC II Light Duty Pop - Countywide [1]		2,384,780	2,404,764	2,439,856	2,476,692
EMFAC2021 ACC II Light Duty Pop - Unincorporated San Diego County		336,899	334,138	333,582	337,111
EMFAC2021 ACC II Light Duty EV/PHEV Pop - Countywide [1]		475,731	1,063,733	1,631,431	2,037,270
EMFAC2021 ACC II Light Duty EV/PHEV Pop - Unincorporated San Diego County		67,207	147,804	223,053	277,300
Calculated EMFAC2021 ACC II Light Duty EV/PHEV percentage		20%	44%	67%	82%
Targeted EV/PHEV Pop percentage under measure		31%	55%	78%	93%
Increased EV/PHEV Pop percentage under measure		11%	11%	11%	11%
Targeted EV/PHEV Pop under measure		104,439	183,776	260,194	313,514
Additional EV/PHEV Pop under measure		37,232	35,972	37,141	36,213
EMFAC2021 EV:PHEV Ratio with ACC II adjustments		4.5	6.3	7.9	9.0
Additional EV Pop under measure		30,486	31,037	32,984	32,592
Additional PHEV Pop under measure		6,746	4,935	4,157	3,622
Additional GHG emissions from EVs					
Average annual miles per EV for unincorporated San Diego County (mi/vehicle) [5]		16,908	16,218	15,280	14,424
New EV VMT under measure		515,468,636	503,369,833	504,008,653	470,112,906
Average Efficiency of EV LDV (kWh/100-mi) [5]		41.00	46.00	50.00	52.00
Charged amount (kWh)		211,342,141	231,550,123	252,004,327	244,458,711
Charged amount (MWh)		211,342	231,550	252,004	244,459
County-wide Electricity Emission Factor (MTCO2e/MWh)		0.0036	0.0004	0.0001	0.0000
Additional emissions from electric load from EVs (MTCO2e)		766	103	30	-
Additional GHG emissions from PHEVs					
Average annual miles per PHEV for unincorporated San Diego County (mi/vehicle) [5]		17,297	16,782	15,739	15,010
New PHEV VMT under measure		116,682,003	82,810,804	65,433,526	54,363,297
Average emissions factor from PHEV (gCO2e/mi) [1]		149	134	132	130
Additional PHEV emissions under measure (MTCO2e)		17,335	11,096	8,650	7,059
Average Efficiency of EV LDV (kWh/100-mi) [5]		41	46	50	52
Charged amount (kWh)		47,839,621	38,092,970	32,716,763	28,268,914
Charged amount (MWh)		47,840	38,093	32,717	28,269
County-wide Electricity Emission Factor (MTCO2e/MWh)		0.004	0.000	0.000	-
Additional emissions from electric load from EVs (MTCO2e)		173	17	4	-
Emissions avoided from Equivalent Gasoline/Diesel Vehicles					
Average emissions factor from Gasoline/Diesel mix (gCO2e/mi) [1]		325	318	316	320
Average annual miles per Gasoline/Diesel for unincorporated San Diego County (mi/vehicle)		13,008	11,680	9,852	8,034
Reduced Gasoline/Diesel VMT (mi)		632,150,639	586,180,637	569,442,179	524,476,203
Reduced Gasoline/Diesel emissions under measure (MTCO2e)		205,323	186,205	180,169	167,740
Total Emission Reductions from Increased LDV EV/PHEV Mix (MTCO2e)		**187,222**	**175,006**	**171,489**	**160,681**

T-3.1 (continued)

Increase the use of electric and other zero-emission vehicles in the unincorporated area by:
- Installing 2,040 publicly available electric vehicle charging stations by 2028.
- Requiring the electrification of loading docks and idling reduction in new commercial and industrial development by 2030.
- Amending the County's Code of Regulatory Ordinances by 2026 to require (Tier 2) CalGreen or similar electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multi-family residential and non-residential construction.
- Developing a program by 2026 to incentivize EV purchases and school bus electrification

	2019	2030	2035	2040	2045
Increase medium and heavy duty EV/PHEV Population					
State-level EV Forecasts and Targets	**2019**	**2030**	**2035**	**2040**	**2045**
Statewide Medium- and Heavy-Duty Population [3]		(47,575,233)	2,139,839	2,237,119	2,358,292
Statewide Medium- and Heavy-Duty EV population [3]		107,184	325,963	575,437	797,170
Statewide MDV EV Population Target under 2020 MSS [4]		40,788	181,177	387,900	582,910
Statewide HDV EV Population Target under EO N-79-20 [4]		171,176	361,272	601,485	827,867
Statewide Target Percent Increase in Commercial EVs		**98%**	**66%**	**72%**	**77%**
Unincorporated San Diego County Target Percent Increase in Commercial EVs		98%	66%	72%	77%
					-362108%
EMFAC2021 Medium/Heavy Duty Pop - Countywide [1]		149,313	154,389	160,489	167,814
EMFAC2021 Medium/Heavy Duty Pop - unincorporated San Diego County		21,093	21,452	21,942	22,842
EMFAC2021 Medium/Heavy Duty EV/PHEV Pop - Countywide [1]		8,224	24,706	43,371	59,631
EMFAC2021 Medium/Heavy Duty EV/PHEV Pop - unincorporated San Diego County		1,162	3,433	5,930	8,117
Calculated EMFAC2021 Medium/Heavy Duty EV/PHEV percentage		6%	16%	27%	36%
EMFAC2021 Medium/Heavy Duty conventional vehicle Pop - Countywide [1]		141,089	129,683	117,118	108,183
EMFAC2021 Medium/Heavy Duty conventional vehicle Pop - unincorporated San Diego County		19,932	18,019	16,013	14,725
Increased EV/PHEV Pop percentage under measure		98%	66%	72%	77%
Targeted EV/PHEV Pop under measure		2,298	5,713	10,195	14,364
Additional EV/PHEV Pop under measure		1,136	2,280	4,266	6,248
Target Percentage of EV/PHEV under measure		11%	27%	46%	63%
Additional GHG emissions from EVs					
Average annual miles per EV (mi/vehicle) [1]		22,428	20,732	18,994	17,664
New EVMT under measure		25,472,731	47,266,508	81,023,198	110,359,396
Average Efficiency of EV medium/heavy duty (kWh/100-mi) [1]		100	99	99	100
Charged amount (kWh)		25,530,510	46,801,250	80,106,575	110,075,017
Charged amount (MWh)		25,531	46,801	80,107	110,075
County-wide Electricity Emission Factor (MTCO2e/MWh)		0.0036	0.0004	0.0001	0.0000
Additional GHG emissions from EVs (MTCO2e)		92	21	9	-
Emissions from Equivalent Gasoline/Diesel Vehicles					
Average emissions factor from Gasoline/Diesel mix (gCO2e/mi) [1]		1,247	1,220	1,221	1,237
Average annual miles per Gasoline/Diesel (mi/vehicle) [1]		15,540	15,902	16,611	17,785
Reduced Gasoline/Diesel VMT under IN-2.1 (mi)		17,649,761	36,255,236	70,854,337	111,112,576
Reduced Gasoline/Diesel VMT (mi)		25,472,731	47,266,508	81,023,198	110,359,396
Reduced Gasoline/Diesel emissions under TR-2.1 (MTCO2e)		31,754	57,659	98,956	136,503
Net GHG emissions avoided from increased MHDV EVs (MTCO2e)		**###### ####**	**###### ####**	**###### ####**	**####### ###**
Net GHG emissions avoided from increased EVs (MTCO2e)		**218,884**	**232,645**	**270,436**	**297,184**

Sources:

[1] EMFAC 2021 results for San Diego County Region adjusted for ACC II ZEV requirements for new vehicles. Requirements pertain to both PHEVs and ZEVs.
[2] https://www.driveclean.ca.gov/pev/Charging.php
[3] EMFAC 2021. Statewide EV population. (EMFAC 2021 does not account for statewide targets under EO N-79-20)
[4] CARB's 2020 Mobile Source Strategy META Tool
[5] Source: Community inventory and forecast from EPIC

T-4.1
Expand County Benefit Program by 2026 to provide County employees with tax-free transportation benefits, alternative work schedules, and expand part-time or full-time teleworking options to reduce vehicle miles traveled from employee commutes by 40% in 2030 and 64% in 2045.

	2019	2030	2035	2040	2045
County employee commute miles (scaled by change in employee forecast) (VMT)	101,575,675	114,130,542	118,168,182	121,690,905	125,213,629
County employee commute emissions ($MTCO_2e$)	39,000	32,000	22,000	13,000	14,000
Percent reduction in employee commute miles below 2019 levels with transportation benefits [1]		40%	45%	50%	64%
Annual employee commute miles after reduction (VMT)		68,478,325	64,992,500	60,845,453	45,076,906
Reduction in emissions		40%	45%	50%	64%
Reduction in emissions with transportation benefits ($MTCO_2e$)		12,800	9,900	6,500	8,960
Reduction in VMT below 2019 levels with transportation benefits		45,652,217	53,175,682	60,845,453	80,136,723
Total reduction in emissions ($MTCO_2e$)		**12,800**	**9,900**	**6,500**	**8,960**

SUPPORTING INFORMATION

Existing Benefits
The following is a summary of existing benefit offerings, employee participation, and associated costs for a pre-pandemic and the most recent fiscal year.

Benefit	Amount	Utilization (FY)			
		2018-2019 *[Pre-pandemic]*		2020-2021 *[Previous FY]*	
		Employee Count	Total	Employee Count	Total
Transit reimbursement	$30 – 85*	844	$390,616	252	$88,524
Parking reimbursement	$50 – 300*+	1,267	$1,544,532	1,015	$1,654,091
County Ride Sharing Program (through SANDAG) reimbursement	$25+	10	$1,650	1	$125

*Depending on job classification; +Depending on work location
Source: Email from Meghan Kelly to Ascent on 4/6/23 (Subjectline:FW: draft/deliberative - County Employee commute data)

T-4.2
Develop a rebate program by 2026 for County employees to purchase electric vehicles, bicycles, and scooters for commute use.

		2025	2030	2035	2040	2045
Average rebate per vehicle	$ 2,000					
No. of EVs purchased using rebate each year (from 2026) through 2050 [1]	120					
No. of EVs purchased using rebate by each target year (from 2026)			600	1,200	1,800	2,400
Annual VMT per County employee			5,395	5,395	5,395	5,395
New Employee Commute VMT from battery electric vehicle purchased using rebate program (from 2026)			3,237,300	6,474,599	9,711,899	12,949,199
Percent of Employee Commute Annual VMT from the rebate program (new employee commute e-VMT/total annual employee commute VMT)			3%	5%	8%	10%
Emission reduction ($MTCO_2e$)			908	1,205	1,038	1,448

Additional GHG emissions from EVs

		2030	2035	2040	2045
Average Efficiency of EV LDV (kWh/mi) [1]		0.41	0.46	0.5	0.52
Charged amount (MWh)		1,327	2,978	4,856	6,734
County-wide Electricity Emission Factor ($MTCO_2e$/MWh)		0.0036	0.0004	0.0001	0.0000
Additional emissions from electric load from EVs ($MTCO_2e$)		5	1	1	-
Net Emission reduction ($MTCO_2e$)		**903**	**1,204**	**1,037**	**1,448**

[1] Data from email receieved from County (Meghan Kelly) during second review of measures

T-5.1

Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the unincorporated area.

	2019	**2030**	**2035**	**2040**	**2045**
VMT from passenger vehicles (%)		93%	93%	93%	92%
VMT from passenger vehicles per year (miles)		3,026,461,227	3,096,467,690	3,145,237,071	3,192,017,469
Emissions from passenger vehicles		780,263	529,267	303,686	302,802
Provide Pedestrian Network Improvement [1]					
Existing sidewalk length [2] (miles)	330.54				
Increased sidewalk length with measure [existing + increase from action] (miles) [2]		345	360	375	390
Elasticity of household VMT with respect to the ratio of sidewalks-to-streets [3]					
Percent reduction in GHG emissions [4]		0.2%	0.4%	0.7%	0.9%
Expand Bikeway Network Miles (applicable to class I, II, and IV bikeway) [5]					
Existing bikeway miles [2]	158				
Bikeway miles with measure [existing + increase from action] (miles) [2]		315	472	629	786
Bicycle mode share [6]					
Vehicle mode share [6]					
Average one-way bicycle trip length (miles per trip) [6]					
Average one-way vehicle trip length (miles per trip) [6]					
Elasticity of bike commuters with respect to bikeway miles per 10,000 population [6]					
Percent reduction in GHG emissions		0.006%	0.013%	0.019%	0.025%
Net emission reduction from the measure (%)		0.23%	0.46%	0.69%	0.92%
Net VMT reduction from LDVs from the measure (%) [7]		0.23%	0.46%	0.69%	0.92%
Net emission reduction from the measure (MTCO2e)		**1,756**	**2,425**	**2,100**	**2,800**
Net VMT reduction from LDVs from the measure (miles)		6,810,768	14,189,556	21,748,021	29,515,564

[1] CAPCOA, 2021, measure T-18. Provide Pedestrian Network Improvement
[2] Source: Information received from attachment through email from Meghan sent to Ascent on 5/24/23 (see information below)
[3] Frank, L., M. Greenwald, S. Kavage, and A. Devlin. 2011. An Assessment of Urban Form and Pedestrian and Transit Improvements as an Integrated GHG Reduction Strategy. WSDOT Research Report WA-RD 765.1, Washington State Department of Transportation. April. Available: www.wsdot.wa.gov/research/reports/fullreports/765.1.pdf. in CAPCOA, 2021
[4] Maximum reduction possible is 6.4% (CAPOA, 2021)
[5] Federal Highway Administration (FHWA). 2017. National Household Travel Survey – 2017 Table Designer. Travel Day PMT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Found in
[6] Pucher, J., and Buehler, R. 2011. Analysis of Bicycling Trends and Policies in Large North American Cities: Lessons for New York. March. Available: http://www.utrc2.org/sites/default/files/pubs/analysis-bike-final_0.pdf. Found in CAPCOA, 2021
[7] The percent reduction in VMT would be the same as the percent reduction in GHG emissions (Source, CAPCOA, 2021)

T-5.2
Develop a countywide Safe Routes to Schools program to reduce vehicle miles traveled to schools by 1.2% by 2030.

		2019	2025	2030	2035	2040	2045
Morning peak hours passenger daily VMT		1,682,582	1,707,513	1,733,366	1,755,730	1,780,222	1,803,601
Morning peak hours passenger emissions per year ($MTCO_2e$)			190,657	155,069	104,135	59,645	59,369
% VMT to schools [1]	12%						
Number of school days in California [2]	180						
VMT to schools per year				37,440,716	37,923,778	38,452,801	38,957,773
Passenger emissions from school trips per year (MTCO2e)				18,608	12,496	7,157	7,124
VMT and GHG reduction from countywide SR2S program strategy and/or infrastructure updates (see notes below):							
% VMT reduction by outreach activities [3] [4]	1.2%						
Total VMT reduction (%)	1.2%						
Total GHG reduction (%)	1.2%						
Emisions reduction ($MTCO_2e$)				**214**	**144**	**82**	**82**

[1] Assuming percent of trips to be same as percent of morning peak hour passenger VMT(Nationally, 10%–14% of car trips during morning rush hour are for school travel. Source: DOT SR2S https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs)
[2] NCES, n.d. State Education Practices (SEP). Availabe at: https://nces.ed.gov/programs/statereform/tab1_1-2020.asp
[3] Outreach activities that provides families and students with customized information, incentives, and support to encourage the use of SR2S
[4] For taking a conservative approach, the calculations assume that implementation will achieve half of maximum potential reduction possible from the measure described in CAPCOA, 2021

T-6.1

Develop a program to provide free transit passes and/or free trips in the unincorporated area to reduce vehicle miles traveled in the unincorporated area by 1.2% by 2030.

		2030	**2035**	**2040**	**2045**
Transit accesible passenger VMT (miles)		986,265,265	1,168,100,150	1,365,124,344	1,885,611,101
GHG from Transit accesible passenger VMT ($MTCO_2e$)		254,273	199,659	131,809	178,873
Eliminate Transit Fares [1] [5]					
Percent reduction in transit fare with measure [1]		100%	100%	100%	100%
Percent of plan/community transit routes that receive reduced fares		100%	100%	100%	100%
Elasticity of transit ridership with respect to transit fare [3]	0.3				
Transit mode share in community [4]	2.4%				
Vehicle mode share in community [4]	94.9%				
Statewide mode shift factor [4]	57.8%				
Emissions Reduction [1] [5] (%)		1.20%	1.20%	1.20%	1.20%
VMT reduction from measure 7.3 (%) [2] [5]		1.20%	1.20%	1.20%	1.20%
Emission Reduction ($MTCO_2e$)		**3,051**	**2,396**	**1,582**	**2,146**
VMT Reduction (miles)		11,835,183	14,017,202	16,381,492	22,627,333

Note:

[1] CAPCOA 2021 (T-29. Reduce Transit Fares)

[2] The percent reduction in passenger vehicle fuel consumption would be the same as the percent reduction in GHG emissions (Source, CAPCOA, 2021)

[3] Handy, S., K. Lovejoy, M. Boarnet, and S. Spears. 2013. Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions. October. Available: https://ww2.arb.ca.gov/sites/default/files/2020-06/Impacts_of_Transit_Service_Strategies_on_Passenger_Vehicle_Use_and_Greenhouse_Gas_Emissions_Policy_Brief.pdf. Found in CAPCOA, 2021

[4] Federal Highway Administration (FHWA). 2017a. National Household Travel Survey–2017 Table Designer. Travel Day PMT by TRPTRANS by HH_CBSA. Available: https://nhts.ornl.gov/. Found in CAPCOA, 2021

[5] The measure reductions will be applicable to Transit accessible VMT only

T-6.2
Increase access to Transit Priority Areas by 5% in the unincorporated area and implement transit-supportive roadway treatments such as traffic signal communication and curb extensions along County-maintained roadways to optimize traffic flow for transit and pedestrians by 2030.

	2025	2030	2035	2040	2045
Unincorporated County Population within one-mile of Transit Priority Areas (TPAs) [1]	134,601	135,914	137,227	141,584	145,940
Percent of Unincorporated Population within one-mile of TPAs (future condition without this action)	27%	28%	28%	28%	29%
Percent Increase in Unincorporated Population within one-mile of TPAs (future condition with this action)		5%	10%	15%	30%
Transit accessible passenger VMT from TPAs (%)		33%	38%	43%	59%
Transit accessible passenger VMT from TPAs (miles)		986,265,265	1,168,100,150	1,365,124,344	1,885,611,101
Transit accessible passenger VMT after applying other VMT measures (miles)		979,023,928	1,153,474,471	1,342,934,116	1,855,647,522
GHG from Transit accesible passenger VMT after applying other VMT measures (%)		33%	38%	43%	59%
GHG from transit accesible passenger VMT ($MTCO_2e$)		254,273	199,659	131,809	178,873
GHG from transit accesible passenger VMT after applying other VMT measures ($MTCO_2e$)		252,303	197,090	129,626	175,991
Percent reduction in VMT and GHG emissions [2]		5%	10%	15%	20%
Emission reduction ($MTCO_2e$)		**12,615**	**19,709**	**19,444**	**35,198**
VMT reduction		48,951,196	115,347,447	201,440,117	371,129,504

[1] Transit Priority Areas (TPAs) are defined as areas within a half mile of a "major transit stop," which is defined in Public Resources Code 21064.3 as a site containing any of the following: (a) an existing rail or Bus Rapid Transit station; (b) A ferry terminal served by either a bus or rail transit service; (c) the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods. The TPAs used in this calculation are based on the planned transit systems of SANDAG's 2021 Regional Plan.

[2] CAPCOA, 2021, Measure T-25. Extend Transit Network Coverage or Hours; T-26. Increase Transit Service Frequency; T-27. Implementation Transit-Supportive Roadway Treatments; T-28. Provide Bus Rapid Transit; T-1. Increase Residential Density; T-2. Increase Job Density; T-3. Provide Transit-Oriented Development; Integrate Affordable and Below Market Rate Housing

T-6.3
Increase access to first/last mile transportation services and connections (e.g., neighborhood electric vehicles, microtransit, bike/scooter-share) to reduce vehicle miles traveled by 7% within the unincorporated area by 2030.

	2025	2030	2035	2040	2045
Intrazonal VMT (VMT within a TAZ) (annual) [1]	55,460,663	55,205,792	54,950,920	54,973,822	54,996,724
Intrazonal VMT (VMT within a TAZ) (annual) after applying other VMT measures		55,073,702	54,691,368	54,585,972	54,480,468
Share of Intrazonal annual VMT (VMT within a TAZ) compared to total passenger VMT, after applying other VMT measures		2%	2%	2%	2%
GHG from Intrazonal VMT compared to total passenger emissions (%), after applying other VMT measures		2%	2%	2%	2%
GHG from Intrazonal VMT after applying other VMT measures compared to total passenger emissions ($MTCO_2e$)		14,199	9,348	5,271	5,168
Percent reductions in intrazonal VMT		7%	13%	19%	25%
Emissions reduced by applying measure to Intrazonal VMT ($MTCO_2e$)		994	1,215	1,001	1,292
Total emission reduction ($MTCO_2e$)		**994**	**1,215**	**1,001**	**1,292**
VMT reduced by applying measure to Intrazonal VMT (miles)		3,855,159	7,109,878	10,371,335	13,620,117

[1] VMT data from SANDAG, adjusted by Fehr & Peers to exclude military and tribal lands

CAP Appendices

The following Draft Climate Action Plan Appendices are included in this document for public review:

Permit Number: __________

COUNTY OF SAN DIEGO

LAND USE AND ENVIRONMENT GROUP

Department of Planning & Development Services

2024 Climate Action Plan Consistency Review Checklist

Introduction

The County of San Diego (County) 2024 Climate Action Plan (CAP) identifies strategies, measures, and actions to meet the County's targets to reduce greenhouse gas (GHG) emissions by 2030 and 2045, consistent with the State's 2022 Scoping Plan for Achieving Carbon Neutrality and legislative GHG reduction targets and demonstrates progress towards the State's 2045 net zero GHG emissions goal. The CAP's attainment of the County's GHG reduction targets is the result of (1) several initiatives to be directly implemented by the County and (2) incorporating GHG-reduction features into the construction and operation of development projects (including County-initiated and privately-initiated projects).

The CAP has been prepared in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15183.5, which allows for public agencies to analyze and mitigate GHG emissions as part of a larger "plan for the reduction of greenhouse gases." The CAP, CAP Consistency Review Checklist (Checklist), and the Supplemental Environmental Impact Report (SEIR) for the CAP collectively include the required elements of "a plan for the reduction of greenhouse gas emissions" set forth in CEQA Guidelines Section 15183.5(b). Therefore, the CAP is a CEQA-qualified climate action plan.

The purpose of the Checklist is two-fold:

1. Incorporate applicable CAP measures and actions into projects when they are not otherwise binding and enforceable, and
2. Provide a streamlined environmental review process for GHG emissions analysis for projects that require and are not exempt from environmental review pursuant to CEQA and determined to be consistent with the CAP.

Refer to the County's Guidelines for Determining Significance for Climate Change (Guidelines) for discussion of the process County staff will follow to evaluate GHG emissions impacts for projects subject to CEQA. The Guidelines identify the County's adopted "threshold of significance" for GHG emissions impacts and explain the role of the Checklist in the streamlined environmental review process.

Checklist Applicability

The Checklist applies to discretionary projects that are subject to and not exempt from CEQA (referred to herein as projects). The Checklist is therefore a critical implementation tool for incorporating CAP measures and actions that are not otherwise binding and enforceable into development projects (including new development applications and expansions or renovations of existing development).

DRAFT

Implementation of measures that do not apply to projects will occur through the implementation mechanisms identified in Chapter 5 of the CAP. Implementation of applicable CAP measures and actions by projects will help the County achieve incremental reductions towards the CAP targets, with additional reductions occurring through County initiatives and measures related to existing development that are implemented outside of the Checklist process.

Checklist Overview

The Checklist establishes a two-step process that project proponents shall follow to determine if projects are consistent with the CAP and whether they may have a significant cumulative impact under the County's adopted GHG thresholds of significance.

Step 1 of the Checklist assesses a project's consistency with the growth projections used in the CAP to estimate future GHG emissions from activities occurring in the unincorporated area and County facilities and operations. Because the CAP uses growth projections based on implementation of the adopted General Plan, the first step in determining a project's consistency with the CAP is to demonstrate its consistency with the regional categories and land use designations of the General Plan. All projects must demonstrate consistency with existing General Plan regional categories, land use designations, and the uses and development density and intensity allowed under the Zoning Ordinance.

If a project is consistent with the General Plan, then Step 2 of the Checklist should be completed. If a project is not consistent with the regional categories or land use designations of the General Plan, then it shall not use the CAP Consistency Checklist for CEQA streamlining.

Step 2 of the Checklist sets forth CAP measures and actions in the form of "consistency requirements" that project proponents are required to incorporate into their projects to demonstrate compliance with the CAP. Project proponents are required to demonstrate project consistency with the CAP consistency requirements or demonstrate why the requirements are not applicable to their project.

Projects that are consistent with the CAP, as determined using Steps 1 and 2 in this Checklist, may rely on the CAP for the cumulative impacts analysis of GHG emissions under CEQA. Projects that are not consistent with the CAP as determined by Steps 1 or 2 of the Checklist, shall not use the CAP Consistency Checklist for CEQA streamlining.

Checklist Completion and Review Procedures

General procedures for Checklist completion and review are described below, with more specific directions provided in Steps 1 and 2 of the Checklist.

1. The County's Department of Planning & Development Services (PDS) reviews development applications and makes determinations regarding project environmental review requirements under CEQA. Procedures for CEQA can be found on the County's Process Guidance & Regulations/Statutes Homepage.

2. The project proponent shall complete the Checklist, and must provide substantial evidence to demonstrate project consistency with the CAP.

3. When completing Step 2 of the Checklist, the project proponent must provide substantial evidence demonstrating how each applicable CAP consistency requirement will be implemented by or incorporated into the project.

4. CAP consistency requirements determined to be applicable to the project in Step 2 of the Checklist shall be required as conditions of project approval.

5. Projects that cannot demonstrate consistency with the CAP using this Checklist are required to prepare a separate GHG analysis as part of the CEQA document prepared for the project and may be required to prepare an Environmental Impact Report (EIR). Refer to the County's Guidelines for Determining Significance for Climate Change (Guidelines) for a complete description of the County's procedural and content requirements for evaluating a project's GHG emissions under CEQA.

Checklist Updates

The Checklist may be administratively updated by the County from time to time to comply with amendments to State laws or court directives, or to remove measures that may become mandatory through future updates to State or local codes. Administrative revisions to the Checklist will be limited to changes that do not trigger a subsequent EIR or a supplement to the SEIR for the CAP pursuant to CEQA Guidelines Section 15162. Administrative revisions, as described above, will not require approval by the Board of Supervisors (Board). All other changes to the Checklist require Board approval.

Comprehensive updates to the Checklist will be coordinated with each CAP update and will require Board approval. Future updates to the CAP and Checklist shall comply with CEQA.

Application Information

Contact Information

Project No. and Name: ______________________

Property Address and APN: ______________________

Applicant Name and Co.: ______________________

Contact Phone: ______________________ Contact Email: ______________________

Was a consultant retained to complete this checklist? ☐ Yes ☐ No
If Yes, complete the following:

Consultant Name: ______________________ Contact Phone: ______________________

Company Name: ______________________ Contact Email: ______________________

Project Information

1. What is the size of the project site (acres [gross and net])? ______________________
2. Identify all applicable proposed land uses (indicate square footage [gross and net]):
   - ☐ Residential (indicate # of single-family dwelling units): ______________________
   - ☐ Residential (indicate # of multi-family dwelling units): ______________________
   - ☐ Commercial (indicate total square footage [gross and net]): ______________________
   - ☐ Industrial (indicate total square footage [gross and net]): ______________________
   - ☐ Agricultural (indicate total acreage [gross and net]): ______________________
   - ☐ Other (describe): ______________________
3. Provide a description of the project. This description should match the project description used for the CEQA document. The description may be attached to the Checklist if there are space constraints.

Step 1: Demonstrate Consistency with the General Plan

The CAP uses growth projections based on implementation of the adopted General Plan to estimate future GHG emissions from activities occurring in the unincorporated area and County facilities and operations. Therefore, the first step in determining a project's consistency with the CAP is to demonstrate its consistency with the General Plan and Zoning Ordinance.

All projects must demonstrate consistency with existing General Plan regional categories, land use designations, and zoning designations. If a project is consistent with the General Plan and Zoning Ordinance, then Step 2 of the Checklist should be completed. If a project is not consistent with the regional categories and land use designations of the General Plan and zoning designations, then it shall not use the CAP Consistency Checklist for CEQA streamlining.

Step 1: Demonstrate Consistency with the General Plan		
CAP Consistency Requirement	Yes	No
1. Is the proposed project consistent with the existing General Plan regional category and land use designations and the uses and development density and intensity allowed under the Zoning Ordinance?	☐	☐

Provide substantial evidence supporting the project's General Plan consistency determination. Attach additional information as needed.

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If **"Yes,"** proceed to Step 2: Demonstrate Consistency with CAP Measures and Actions

If **"No,"** the project is not consistent with the CAP and shall not use the CAP Consistency Checklist for CEQA streamlining. Such projects are required to prepare preparation of a separate GHG analysis as part of the CEQA document prepared for the project and may be required to prepare an EIR. Refer to the County's Guidelines for Determining Significance for Climate Change (Guidelines) for a complete description of the County's procedural and content requirements for evaluating a project's GHG emissions under CEQA.

Step 2: Demonstrate Consistency with CAP Measures and Actions

The second step of the CAP consistency review is to demonstrate a project's consistency with applicable CAP measures and actions. Projects are required to demonstrate consistency with the CAP consistency requirements or demonstrate why the requirements are not applicable. For ease of reference, two sets of CAP consistency requirements are provided in this section: one set of requirements that applies to privately-initiated projects (Table 1), and a second set of requirements that applies to County-initiated projects (Table 2).

Table 1. CAP Consistency Requirements for Privately-Initiated Projects

CAP Consistency Requirement (Privately-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
Built Environment and Transportation				
1. Electrify Loading Docks If the project includes cold storage or refrigerated warehouse facilities, it must comply with the County's Code of Regulatory Ordinances as amended to require electric truck loading docks must be equipped with adequate infrastructure to deliver electricity to electric-powered truck refrigeration units (e-TRUs). **Note:** The County will amend the Code of Regulatory Ordinances by 2030, pursuant to CAP Action T-3.1. This requirement does not apply to projects unless the Code of Regulatory Ordinances has been amended and the amendments have gone into effect. *Check "N/A" if the project is not a privately-initiated project, is not subject to the Code of Regulatory Ordinances as amended, or if the amendments are not in effect.*	T-3 (T-3.1)	☐	☐	☐

Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed.

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Table 1. CAP Consistency Requirements for Privately-Initiated Projects				
CAP Consistency Requirement (Privately-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
2. Install Electric Vehicle Charging Infrastructure The project must comply with the County's Code of Regulatory Ordinances as amended to require (Tier 2) CALGreen or similar electric vehicle charging infrastructure installations and preferential parking for ZEVs for new multifamily residential and nonresidential construction. If the Code of Regulatory Ordinances has not yet been amended, the project shall achieve Tier 2 status as set forth in the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendix A4 Residential Voluntary Measures, Division A4.6, Tier 1 and Tier 2, Section A4.601.5, Tier 2, and Appendix A5 Nonresidential Voluntary Measures, Division A5.6, Voluntary Tiers, Section A5.601.3 *CALGreen* Tier 2. **Note:** The County will amend the Code of Regulatory Ordinances by 2026, pursuant to CAP Action T-3.1. *Check "N/A" if the project is not a privately-initiated project or is not subject to CALGreen or the Code of Regulatory Ordinances as amended.*	T-3 (T-3.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed.				
3. Increase Active Transportation If both of the following conditions are met, the project must incorporate sidewalk and bikeway improvements from the County's Active Transportation Plan. 1. Intersection or roadway segment improvements are proposed and/or required as part of the project, AND 2. The County's Active Transportation Plan identifies sidewalks or on-road bikeway facilities at intersection(s) or on roadway segment(s) that would be improved as part of the project. *Check "N/A" if the project does not meet both conditions.*	T-5 (T-5.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed.				

Table 1. CAP Consistency Requirements for Privately-Initiated Projects				
CAP Consistency Requirement (Privately-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
4. Reduce Single Occupancy Vehicle Trips When the County has adopted the Transportation Demand Management (TDM) ordinance and it has gone into effect, the project must comply with the ordinance. **Note:** The County will adopt the TDM ordinance by 2028, pursuant to CAP Action T-6.2. This requirement does not apply to projects unless the TDM Ordinance has been adopted and has gone into effect. *Check "N/A" if the project is not a privately-initiated project, is not subject to the Code of Regulatory Ordinances as amended, or if the amendments are not in effect.*	T-6 (T-6.2)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____ ____				
Energy				
5. Electrify Buildings and Appliances The project must comply with the County's Code of Regulatory Ordinances as amended to incorporate all-electric appliances and equipment in new residential, commercial, and industrial construction or incorporate (Tier 2) CALGreen or similar energy efficiency requirements for existing development projects. If the Code of Regulatory Ordinances has not yet been amended, the project shall achieve Tier 2 status as set forth in the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendix A4 Residential Voluntary Measures, Division A4.6, Tier 1 and Tier 2, Section A4.601.5, Tier 2, and Appendix A5 Nonresidential Voluntary Measures, Division A5.6, Voluntary Tiers, Section A5.601.3 *CALGreen* Tier 2. **Note:** The County will amend the Code of Regulatory Ordinances by 2026 to establish requirements for existing development projects, pursuant to CAP Actions E-2.1 and E-2.2. *Check "N/A" if the project is not a privately-initiated project or is not subject to CALGreen or the Code of Regulatory Ordinances as amended.*	E-2 (E-2.1, E-2.2)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____ ____ ____				

Table 1. CAP Consistency Requirements for Privately-Initiated Projects				
CAP Consistency Requirement (Privately-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
6. Increase Renewable Energy The project must comply with the County's Code of Regulatory Ordinances as amended to incorporate (Tier 2) CALGreen or similar renewable energy requirements for new residential and nonresidential construction. If the Code of Regulatory Ordinances has not yet been amended, the project shall achieve Tier 2 status as set forth in the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendix A4 Residential Voluntary Measures, Division A4.6, Tier 1 and Tier 2, Section A4.601.5, Tier 2, and Appendix A5 Nonresidential Voluntary Measures, Division A5.6, Voluntary Tiers, Section A5.601.3 CALGreen Tier 2. **Note:** The County will amend the Code of Regulatory Ordinances by 2026, pursuant to CAP Action E-3.1. *Check "N/A" if the project is not a privately-initiated project or is not subject to CALGreen or the Code of Regulatory Ordinances as amended.*	E-3 (E-3.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____ ____				
Water and Wastewater				
7. Increase Water Efficiency The project must comply with the County's Code of Regulatory Ordinances as amended to require (Tier 2) CALGreen or similar water efficiency requirements and reduced outdoor water use for landscaping requirements. **Residential projects:** If the Code of Regulatory Ordinances has not yet been amended, residential projects must comply with the requirements of the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendix A4 Voluntary Residential Measures by complying with at least three elective measures from Section A4.303, Section A4.304, and Section A4.305 Tier 2 Water Efficiency and Conservation Requirements. **Nonresidential projects:** If the Code of Regulatory Ordinances has not yet been amended, nonresidential projects must comply with the requirements of the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen), Appendix A5 Voluntary Nonresidential Measures, Section A5.303.2.3.2 Tier 2 Water Efficiency and Conservation Requirements and three elective measures from Section A5.303, Section A5.304, and Section A5.305 Tier 2 Water Efficiency and Conservation Requirements.	W-2 (W-2.1, W-2.2)	☐	☐	☐

Table 1. CAP Consistency Requirements for Privately-Initiated Projects				
CAP Consistency Requirement (Privately-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
Note: The County will amend the Code of Regulatory Ordinances by 2026, pursuant to CAP Action W-2.1 and W-2.2. *Check "N/A" if the project is not a privately-initiated project, is not subject to CALGreen or the Code of Regulatory Ordinances as amended.*				
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. __________ __________ __________ __________ __________ __________ __________				
Agriculture and Conservation				
8. Increase Tree Preservation If the County's program to preserve native trees is in effect, the project must comply. *Check "N/A" if the project is not a privately-initiated project, is not subject to the native tree preservation program, or if the program is not in effect.*	A-2 (A-2.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. __________ __________ __________ __________ __________ __________ __________				
9. Increase Tree Planting Single family residential: The project must comply with the tree planting requirements of the County's Landscaping Ordinance. Each new single family residential project shall include two trees per dwelling unit. *Check "N/A" if the project is not subject to the Landscaping Ordinance.*	A-2 (A-2.2)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. __________ __________ __________ __________ __________ __________ __________				

Table 2. CAP Consistency Requirements for County-Initiated Projects				
CAP Consistency Requirement (County-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
Built Environment and Transportation				
1. Use Electric-Powered or Zero Emission Construction Vehicles and Equipment The project must use electric-powered or other zero emissions vehicles and equipment during construction activities. This requirement applies to medium- and heavy-duty vehicles and equipment (defined as equal to or greater than 50 horsepower). *Check "N/A" if the project is not a County-initiated project.* *Check "N/A" if the project does not require the use of medium- or heavy-duty construction vehicles or equipment.* *Check "N/A" if electric-powered or zero emission vehicles and equipment are not commercially available for the project's medium- and heavy-duty vehicle and equipment needs during construction. To support this "N/A" response, demonstrate that a minimum of three fleet owners/operators/fuel providers in San Diego County or adjacent counties were contacted and responded that electric-powered or other zero emission equipment and/or fuel options are not commercially available for the project's vehicle and equipment needs during construction.*	T-1 (T-1.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____ ____				
Energy				
2. Increase Energy Efficiency and Renewable Energy Use The project must comply with the County Facilities Zero Carbon Portfolio Plan by complying with the following: 1. Use electric appliances and equipment. Appliances and equipment powered by non-electric sources are not permitted. 2. Achieve Zero Net Energy (i.e., produce enough renewable energy to meet its own annual energy consumption requirements) *Check "N/A" if not a County-initiated project.*	E-1 (E-1.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____				

Table 2. CAP Consistency Requirements for County-Initiated Projects				
CAP Consistency Requirement (County-Initiated Project)	Supporting CAP Measure (Action)	Project Consistency Determination		
		Consistent	Not Consistent	N/A
Water and Wastewater				
3. Increase Water Efficiency The project must incorporate applicable measures identified in the County's Water Efficiency Plan. *Check "N/A" if the project is privately initiated.*	W-1 (W-1.1)	☐	☐	☐
Provide substantial evidence supporting the project's consistency determination. Attach additional information as needed. ____ ____ ____ ____ ____ ____				

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COUNTY OF SAN DIEGO

GUIDELINES FOR DETERMINING SIGNIFICANCE

CLIMATE CHANGE

LAND USE AND ENVIRONMENT GROUP

Planning & Development Services

October 2023

1. BACKGROUND

The California Environmental Quality Act (CEQA) requires public agencies to review the environmental impacts of proposed projects and consider feasible alternatives and mitigation measures to reduce significant adverse environmental effects. As part of this analysis, agencies must consider potential adverse effects that may result from a proposed project's greenhouse gas (GHG) emissions. The California Natural Resources Agency adopted amendments to the CEQA Guidelines to address GHG emissions, consistent with the Legislature's directive in Public Resources Code Section 21083.05 (enacted as part of Senate Bill (SB) 97 [Chapter 185, Statutes 2007]). These amendments took effect in 2010.

GHG emissions have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to the significant cumulative impact of global climate change. Cumulative impacts are those that result from the combination of past, present, and probable future projects, producing related effects. The proper context for addressing GHG emissions is within an assessment of cumulative impacts because, although it is unlikely that a single project would contribute significantly to climate change, cumulative emissions from many projects could impact global GHG concentrations and the global climate system. This document is to be used to determine whether individual projects would have a considerable cumulative incremental contribution to the significant impact of global climate change.

The County's Climate Action Plan (CAP) is a long-term programmatic plan that identifies strategies, measures, and actions to meet the County's targets to reduce GHG emissions by 2030 and 2045, consistent with the State's 2022 Scoping Plan for Achieving Carbon Neutrality and legislative GHG reduction targets, and demonstrates progress towards the State's 2045 net zero GHG emissions goal. The CAP has been prepared in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3) and 15183.5(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulative if it complies with the requirements of the CAP. The CAP, consistent with CEQA Guidelines Section 15183.5, includes the following components:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review.

Chapter 5 of the CAP details how the CAP complies with each of these elements. The CAP also updates and implements General Plan Goal COS-20 and Policy COS-20.1 and mitigation measures CC-1.2, CC-1.7, and CC-1.8 of the 2011 General Plan Update (GPU) Final Program Environmental Impact Report (PEIR). Mitigation Measures CC-1.2, CC-1.7, and CC-1.8, identified in the 2011 GPU PEIR, called for the preparation of a Climate Change Action Plan designed to reach specified GHG reduction targets from community and local government operations, modifications to the Guidelines for Determining Significance for Climate Change to provide guidance on the evaluation of GHG impacts considering current regulatory requirements and determine a project's consistency with the CAP, and adoption of a GHG Threshold of Significance.

These Guidelines for Determining Significance for Climate Change (Guidelines) have been developed pursuant to the updated Mitigation Measures CC-1.7 and CC-1.8 of the 2011 GPU PEIR. The CAP document itself has been prepared to comply with the updated Mitigation Measure CC-1.2 of the 2011 GPU PEIR to mitigate the GHG impacts of the General Plan. The Guidelines were adopted by the Board of Supervisors (Board) by separate resolution concurrently with the County's CAP on [DATE], consistent with CEQA Guidelines section 15064.7.

The County's CAP is also intended to be used for future project-specific GHG emissions analyses by being prepared consistent with the tiering and streamlining provisions of Section 15183.5 of the CEQA Guidelines. The Draft Supplemental Environmental Impact Report (SEIR) for the CAP provides the appropriate level of environmental review to allow future projects to tier from and streamline their analysis of GHG emissions pursuant to CEQA Guidelines Section 15183.5(b)(2).

2. THRESHOLD OF SIGNIFICANCE

County staff will use these Guidelines as part of the environmental review process to evaluate GHG emissions for individual discretionary projects. In accordance with the 2011 GPU PEIR Mitigation Measure CC-1.7 (as updated), the Guidelines incorporate the following "threshold of significance" that was separately adopted by the Board:

A proposed project would have a less than significant cumulatively considerable contribution to climate change impacts if it is found to be consistent with the County's Climate Action Plan; and, would normally have a cumulatively considerable contribution to climate change impacts if it is found to be inconsistent with the County's Climate Action Plan.

This constitutes the threshold of significance adopted by the Board for general use as part of the County's environmental review process. In accordance with CEQA Guidelines Section 15064.7(b), the threshold of significance was developed through a public review process supported by substantial evidence, and was adopted by the Board by separate resolution concurrently with the County's CAP on [DATE].

Consistency with the CAP is determined through the CAP Consistency Review Checklist (Checklist), which is provided as Appendix 8 to the CAP. The Checklist, in conjunction with the CAP, provides a streamlined CEQA review process for proposed discretionary projects. The Checklist is the mechanism that is used to demonstrate consistency with the CAP. If a project does not comply with applicable consistency requirements in the Checklist, it would be determined to be inconsistent with the CAP. The process for determining consistency with the CAP is described below.

3. CLIMATE ACTION PLAN CONSISTENCY REVIEW CHECKLIST

The purpose of the Checklist is to implement GHG reduction measures and actions from the CAP that apply to discretionary projects. The CAP presents the County's comprehensive strategy to reduce GHG emissions to meet its reduction targets. These reductions will be achieved through a combination of County initiatives and reduction actions for both existing and new development. Reduction actions that apply to existing and new development will be implemented through a combination of mandatory requirements and incentives. This Checklist specifically applies to proposed discretionary projects that require environmental review pursuant to CEQA. Therefore, the Checklist represents one implementation tool in the County's overall strategy to implement the CAP. Implementation of measures and actions that do not apply to discretionary projects will occur through the implementation mechanisms identified in Chapter 5 of the CAP. Implementation of applicable reduction measures and actions in discretionary projects will help the County achieve incremental reductions towards its targets, with additional reductions occurring through County initiatives and measures and actions related to existing development that are implemented outside of the Checklist process.

The Checklist will be used during the development review process and will require reduction measures to be incorporated by individual discretionary projects. The Checklist follows a two-step process to determine if projects will have a significant cumulative impact under the County's adopted GHG threshold of significance.

Step 1 in the Checklist assesses a project's consistency with the growth projections and land use assumptions made in the CAP. Projections provide insight into the scale of reductions needed to meet reduction targets. The CAP uses growth projections based on implementation of the adopted General Plan to estimate future GHG emissions from activities occurring in the unincorporated area and County facilities and operations. All projects must demonstrate consistency with existing General Plan regional categories, land use designations, and the uses and development density and intensity allowed under the Zoning Ordinance. If a project is consistent with the General Plan, its associated growth in terms of GHG emissions was accounted for in the CAP's projections and would not increase emissions beyond what is anticipated in the CAP or inhibit the County from reaching its reduction targets. Emissions from a project consistent with the General Plan have been accounted for in the CAP and the project's implementation of the applicable CAP reduction measures will contribute towards reducing County emissions. As a result, a project that is found to be consistent with the CAP, would result in less than significant GHG emissions and would not result in a cumulatively considerable contribution to a GHG impact.

If a project is consistent with the General Plan, it can be determined to be consistent with the CAP projections and can move forward to Step 2 of the Checklist. If a project is not consistent with the regional categories, land use designations, or the uses and development density and intensity allowed under the Zoning Ordinance, then it shall not use the CAP Consistency Checklist for CEQA streamlining.

Step 2 of the Checklist identifies CAP GHG reduction measures and actions that would apply to discretionary projects and establishes clear requirements to determine a project's consistency with CAP measures and actions. The specific applicable requirements outlined in the Checklist shall be required as a condition of project approval. The project must provide substantial evidence that demonstrates how the proposed project would implement each applicable Checklist requirement described in Appendix 8 to the CAP. If a question in the Checklist is deemed not applicable (N/A) to a project, substantial evidence must be provided.

4. MONITORING AND UPDATE MECHANISMS

The County will prepare a CAP update at least every five years in accordance with the timeline identified in Chapter 5 of the CAP. The CAP update will coincide with the County's Strategic Plan, General Management System, and Capital Improvement Program five-year review cycles. The CAP update will include updated inventories and adjustments to reduction measures, as necessary. Comprehensive updates to these Guidelines and associated Checklist will be coordinated with each CAP update and are subject to approval by the Board. Future updates to the CAP, Guidelines, and Checklist will comply with CEQA.

In addition to the updates to these Guidelines and Checklist that are coordinated with the comprehensive CAP updates at least every five years, the Guidelines and Checklist may also be administratively updated in the interim by the County to comply with amendments to State laws or court directives, or to update measures that may become mandatory through future updates to State or local codes. Administrative revisions to the Guidelines and Checklist will be limited to changes that do not trigger a subsequent EIR or a supplement to the SEIR for the CAP pursuant to CEQA Guidelines Section 15162. Administrative revisions, as described above, will not require approval by the Board.

County of San Diego

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DRAFT - GENERAL PLAN AMENDMENT
(PDS 2020-GPA-20-004)
for the CLIMATE ACTION PLAN

October 26, 2023

The changes to the County of San Diego 2011 General Plan Update (GPU) goal and policy, and 2011 General Plan Update Program Environmental Impact Report (EIR) mitigation measures are provided below and shown in underline (underline) for new additions and strikeout (~~strikeout~~) for deletions:

1) General Plan Goal COS-20 (Governance and Administration)

Reduction of ~~local~~ community-wide (i.e., unincorporated county) and County operations GHG emissions contributing to climate change that meet or exceed requirements of the Global Warming Solutions Act of 2006, as amended by Senate Bill 32 (as amended, Pavley. California Global Warming Solutions Act of 2006: emissions limit) and Assembly Bill 1279 (2022), to achieve net zero greenhouse gas emissions no later than 2045.

(Reference: 2011 General Plan Update Page 5-38)

2) General Plan Policy COS-20.1 (Climate ~~Change~~ Action Plan)

Prepare, maintain, and implement a ~~climate change action plan with a baseline inventory of GHG emissions from all sources; GHG emissions reduction targets and deadlines, and enforceable GHG emissions reduction measures.~~ Climate Action Plan for the reduction of community-wide (i.e., unincorporated county) and County operations GHG emissions consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5 (or as amended).

(Reference: 2011 General Plan Update Page 5-39)

3) 2011 GPU PEIR Mitigation Measure (MM) CC-1.2

Prepare a ~~County Climate Change Action Plan with an updated baseline inventory of GHG emissions from all sources, more detailed GHG emissions reduction targets and deadlines; and a comprehensive and enforceable GHG emissions reduction measures that will achieve a 17% reduction in emissions from County operations from 2006 by 2020 and a 9% reduction in community emissions between 2006 and 2020. Once prepared, implementation of the plan will be monitored and progress reported on a regular basis.~~ Climate Action Plan for the reduction of community-wide (i.e., unincorporated county) and County operations greenhouse gas emissions consistent with state-legislative targets, as described in General Plan Goal COS-20, and consistent with State CEQA Guidelines Section 15183.5 or as amended, as referenced in General Plan Policy COS-20.1. As described in Section 15183.5, the key elements of the Climate Action Plan would include:

"State CEQA Guidelines Section 15183.5(b)(1):

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;

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

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

(F) Be adopted in a public process following environmental review."

Once prepared, implementation of the Climate Action Plan will be monitored and progress reported on a regular basis, as follows:

- Implementation Monitoring Report – prepared annually;
- Greenhouse Gas Emissions Inventory – updated every two years; and

- Climate Action Plan – updated at least every five years.

(Reference: 2011 General Plan Update Program EIR Page 2.17-30)

4) 2011 GPU PEIR MM CC-1.7

~~Incorporate the California ARB's recommendations for a climate change CEQA threshold into the County Guidelines for Determining Significance for Climate Change. These recommendations will include energy, waste, water, and transportation performance measures for new discretionary projects in order to reduce GHG emissions. Should the recommendation not be released in a timely manner,~~ T~~t~~he County will prepare and adopt its own threshold for GHG emissions and shall include this threshold in the *County of San Diego Guidelines for Determining Significance: Climate Change*.

(Reference: 2011 General Plan Update Program EIR Page 2.17-30 and Page 2.17-31)

5) 2011 GPU PEIR MM CC-1.8

~~Revise~~ Prepare *County of San Diego Guidelines for Determining Significance: Climate Change* ~~based on the Climate Change Action Plan~~. The ~~revisions~~ guidelines will ~~include guidance for~~ identify the specific actions proposed discretionary projects will need to take to ~~achieve greater energy, water, waste, and transportation efficiency~~ demonstrate consistency with the Climate Action Plan pursuant to Section 15183.5 of the State CEQA Guidelines or as amended, as described in the 2011 General Plan Update Program EIR Mitigation Measure CC-1.2, as amended.

(Reference: 2011 General Plan Update Program EIR Page 2.17-31)