

SAN MATEO COUNTY

ENERGY EFFICIENCY CLIMATE ACTION PLAN



JUNE 2013

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

This chapter provides a brief summary of the County of San Mateo Energy Efficiency Climate Action Plan (EECAP).



EXECUTIVE SUMMARY

The County of San Mateo has a long-standing commitment to implementing resource conservation programs and proactively working to improve energy efficiency and reduce greenhouse gas (GHG) emissions. This Energy Efficiency Climate Action Plan (EECAP; Plan) recognizes the imperative to act and demonstrates the County's continued commitment to reducing GHG emissions. This EECAP is intended to streamline future environmental review of projects in the unincorporated areas of San Mateo County by following the California Environmental Quality Act (CEQA) Guidelines and meeting the Bay Area Air Quality Management District's (BAAQMD) expectations for a Qualified GHG Reduction Strategy. The EECAP includes the following chapters:

- Introduction (**Chapter 1**);
- Scientific and Regulatory Context (**Chapter 2**);
- Greenhouse Gas (GHG) Emissions Inventory (**Chapter 3**);
- GHG Reduction Strategies (**Chapter 4**);
- Adaptation (**Chapter 5**);
- Implementation (**Chapter 6**); and

- Glossary and appendices provide additional details and information, which are referenced later in this Executive Summary.

CHAPTER 1: INTRODUCTION

Chapter 1 provides a brief overview of the purpose and scope of this EECAP and how it will build off of the County's long-standing tradition of environmental stewardship and leadership. The County has prepared the EECAP not only to meet the requirements of a Qualified GHG Reduction Strategy but to also outline a clear path to successfully implementing policies, programs, and activities that will achieve the County's GHG reduction targets.

CHAPTER 2: SCIENTIFIC AND REGULATORY CONTEXT

Chapter 2 describes the scientific and regulatory context guiding the preparation and implementation of this EECAP. A brief overview of the science behind climate change and its potential implications, as well as relevant federal, state, regional, and local regulatory framework, explains why and how the County is acting to reduce GHG emissions.

While the State of California has passed landmark legislation related to climate change, such as Assembly Bill (AB) 32, Senate Bill (SB) 375, and SB 97, regulatory agencies are also implementing several other state laws related to climate change, land use and transportation, energy and renewable energy, water conservation, and waste and recycling at both the state and local levels. In addition to statewide efforts, the Plan also builds on local planning efforts that the County actively participated in with the City/County Association of San Mateo County (C/CAG) and other incorporated jurisdictions in the county.

CHAPTER 3: GHG EMISSIONS INVENTORY

In order to develop appropriate GHG emissions reduction strategies, the County must have an understanding of baseline and future GHG emissions. **Chapter 3** provides an inventory of community-wide emissions for baseline year 2005, projects emissions using assumptions about economic and demographic growth as well as state and federal policies, and compares the emissions forecast to the County's goals. This information is summarized in **Table ES-1** and **Figure ES-1**.

Table ES-1. 2005 Community-Wide Baseline Emissions by Sector

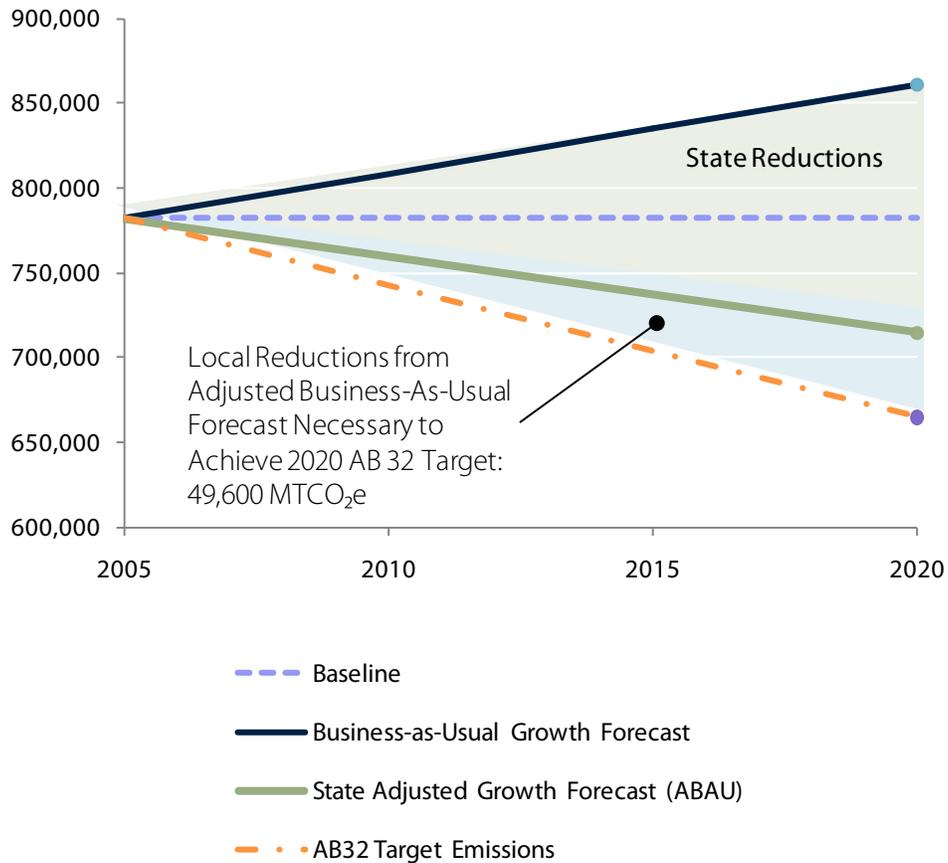
| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|------------------------------------|---------------------|
| Transportation | 479,400 | 61% |
| Commercial and Industrial Energy | 160,900 | 21% |
| Residential Energy | 93,100 | 12% |
| Off-Road | 35,800 | 5% |
| Solid Waste | 8,380 | 1% |
| Agriculture | 3,000 | <1% |
| Water and Wastewater | 1,500 | <1% |
| TOTAL | 782,080 | |

** Due to rounding, the total may not be the sum of component parts.*

The community-wide inventory includes GHG emissions from activities such as electricity use, natural gas use, on-road transportation, solid waste disposal, water and wastewater, off-road equipment, agriculture, and stationary sources. The baseline inventory estimates that community-wide activities generated 905,090 metric tons of carbon dioxide equivalents (MTCO₂e) in 2005. For the purposes of this EECAP, stationary source and direct landfill emissions are excluded from this inventory, resulting in a community-wide total of 782,080 MTCO₂e. Stationary sources and direct landfill emissions are excluded from the EECAP because the County lacks primary regulatory control over many of these facilities because they are permitted and regulated by the Bay Area Air Quality Management District.

Community-wide GHG emissions were forecast for 2020 and 2035 using 2005 energy consumption rates, demographic and economic projections from the Association of Bay Area Governments (ABAG), and estimated growth in off-road equipment and vehicle miles travelled (VMT). This forecast was adjusted to include GHG reductions that will occur as a result of state and federal policy. The County’s reduction goal is a 17% reduction below baseline emissions by 2020. This exceeds the statewide AB 32 target of a 15% reduction below baseline emissions by 2020. The difference between these forecasts and the County’s goal is the GHG emissions reduction needed to achieve those goals. **Figure ES-1** illustrates the GHG emissions forecast, the adjusted forecast, and the reductions required to achieve the AB 32 target of a 15% reduction by 2020. Although the County’s reduction goal is a 17% reduction below baseline emissions, **Figure ES-1** shows the AB 32 reduction target for informational purposes.

Figure ES-1. San Mateo County Forecast Summary and AB 32 Reduction Targets (MTCO₂e)



CHAPTER 4: GHG REDUCTION STRATEGIES

In order to exceed the State-recommended target and achieve the County’s reduction target of 17% below 2005 emissions levels by 2020, the County will need to implement the goals, policies, and actions set forth in this document. The County’s strategy is structured around the following ten topic areas, as shown in **Figure ES-2**:

Figure ES-2. GHG Reduction Topics



The reduction measures included in this Plan build upon existing efforts and provide a diverse mix of regulatory and incentive-based programs for both new and existing development. The reduction measures also aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, GHG reduction measures in the EECAP will reduce GHG emissions in the unincorporated county in 2020 by 67,000 MTCO₂e (see **Table ES-2**). As shown in **Figure ES-3**, local actions from this Plan contribute 31% of total progress toward the County’s reduction target. The remaining 69% of reductions result from state programs. Together, these reductions achieve a 17% decrease by 2020, achieving the County’s target for 2020. Beyond 2020, there is a continued need to reduce GHG emissions even further, which is why this plan includes a forecast and GHG reduction strategies to 2035.

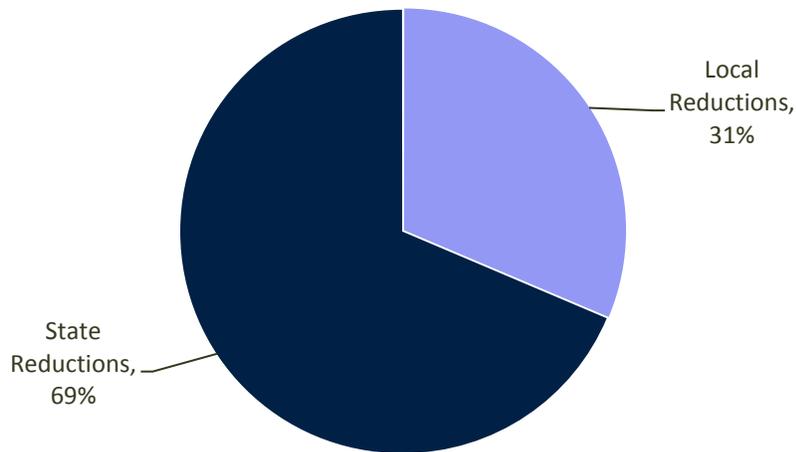
EXECUTIVE SUMMARY

Table ES-2. Local GHG Reduction Summary by Topic (MTCO₂e)

| Goal Topic | 2020 | 2035 |
|-------------------------------------------------|---------------|----------------|
| Residential Energy Efficiency | 5,630 | 10,590 |
| Commercial Energy Efficiency | 15,580 | 43,490 |
| Green Building Ordinance | 6,780 | 69,270 |
| Renewable Energy | 6,480 | 35,420 |
| Transportation | 7,100 | 6,400 |
| Alternative Fuels | 1,780 | 2,200 |
| Waste Diversion | 15,010 | 22,140 |
| Water Efficiency | 170 | 200 |
| Sustainable Agricultural Practices ¹ | - | - |
| Off-Road Technologies | 8,470 | 16,740 |
| Sequestration ¹ | - | - |
| Totals | 67,000 | 206,450 |

1. Not quantified; supportive goal topics.

Figure ES-3. 2020 Local and State Reductions (MTCO₂e)



Achievement of a 17% reduction in GHG emissions by 2020 will exceed state recommendations and BAAQMD threshold requirements for developing a Qualified GHG Reduction Strategy (see **Figure ES-4**). As shown in **Figure ES-5**, through the implementation of this Plan, the unincorporated county's GHG emissions will decrease from 7.2 MTCO₂e per person per year in 2005 to 4.1 MTCO₂e per person per year in 2035.

Figure ES-4. Summary of 2020 GHG Reductions & Reduction Target (MTCO₂e)

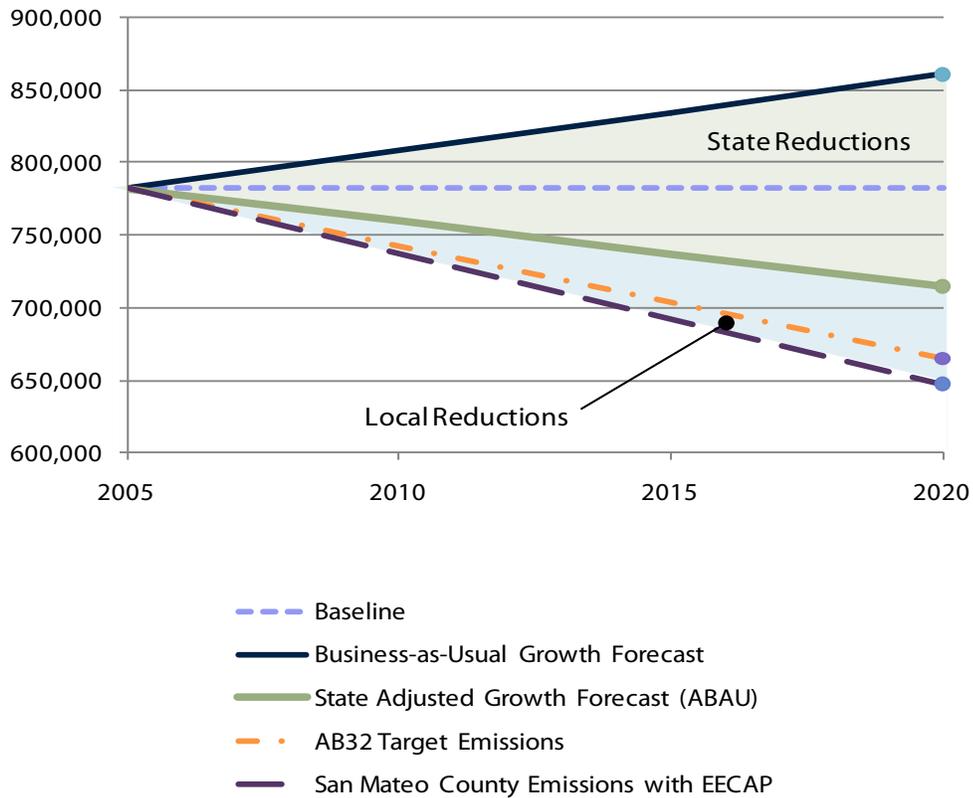
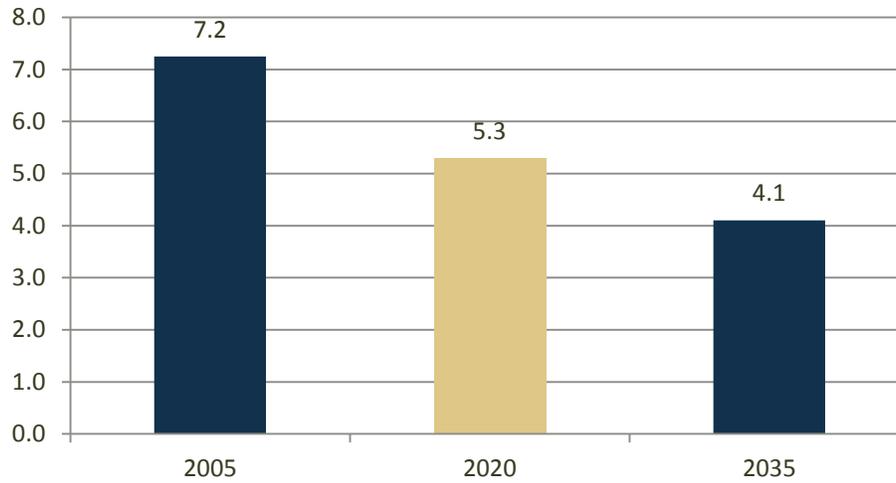


Figure ES-5. GHG Emissions per Service Population (MTCO₂e)

CHAPTER 5: ADAPTATION

Even with significant efforts to mitigate GHG emissions today, future climate projections and scenarios anticipate that climate change may have significant effects on California's precipitation, temperature, and weather patterns. San Mateo County is a coastal county with a significant amount of rural land area, with special vulnerabilities to:

- Increased wildfire risk;
- Negative impacts to wildlife and its habitat;
- Deteriorating public health;
- Decreased supply of fresh water; and
- Increased sea level rise.

As described in **Chapter 5**, the County completed a Vulnerability Assessment to further investigate risks and opportunities for adaptation to climate change. Through the involvement of a working group, the County vetted and identified a framework for adaptation. The adaptation chapter also summarizes current efforts at the state and regional levels to address climate change adaptation such as the Cal-Adapt tool.

CHAPTER 6: IMPLEMENTATION

To ensure successful achievement of the County's reduction target, the EECAP identifies implementation strategies and supporting actions in the implementation chapter. This chapter also includes an implementation matrix with details specific to each measure, including the responsible department, implementation time frame, and co-benefits. The implementation matrix will be a critical tool to monitor the County's progress toward implementing the CAP.

GLOSSARY, APPENDICES, AND SUPPLEMENTAL MATERIALS

To streamline the main document, several technical appendices provide additional detail and information regarding GHG reductions, plan development, and sources. This Plan includes the following six appendices:

- Glossary of key terms used throughout the document (**Appendix A – Glossary**);
- Technical memo on GHG emissions inventory results and methodologies (**Appendix B – Baseline GHG Inventory**);
- Summary of sources and assumptions used to estimate GHG reductions for each reduction measure (**Appendix C – GHG Methods and Assumptions**);

EXECUTIVE SUMMARY

- Detailed discussion of how the Energy Efficiency Climate Action Plan will satisfy BAAQMD requirements for a Qualified GHG Reduction Strategy (**Appendix D – BAAQMD Compliance**);
- An adaptation matrix summarizing key adaptation topics, vulnerabilities, regulatory agencies, and opportunities for mitigation (**Appendix E – Working Adaptation Program**); and
- A checklist to be completed by project development applicants to demonstrate compliance with the EECAP (**Appendix F – New Development Checklist**).

INTRODUCTION

San Mateo County is committed to act as a leader for the mitigation of local impacts on climate change. This Plan identifies the County's strategy for ongoing innovation in sustainability. Through climate change mitigation, the County is working to sustain the long-term health of the natural and built environments and ongoing economic success.



PURPOSE

The purpose of this Energy Efficiency Climate Action Plan (EECAP; Plan) is to demonstrate the County's continued commitment to reduce greenhouse gas (GHG) emissions while protecting the unique resources of San Mateo County. This Plan is intended to streamline future environmental review of development projects in San Mateo County by following the California Environmental Quality Act (CEQA) Guidelines and meeting the Bay Area Air Quality Management District's (BAAQMD) expectations for a Qualified GHG Reduction Strategy.

Strategies in this Plan build on the County's innovative work to date, serving to protect natural systems, reduce waste, improve the energy efficiency of buildings, and ensure long-term access to reliable, clean, and affordable energy. The EECAP also outlines the County's strategy to adapt to a changing climate, protecting the built environment, public health, and natural resources from the vulnerabilities caused by changing climate conditions.

SCOPE

Local governments play a primary role in reducing greenhouse gas emissions and mitigating the potential impacts of climate change. San Mateo County has a long-standing commitment to implementing sustainability programs and proactively working to reduce GHG emissions. This Plan recognizes the importance of County leadership and provides the County's strategy to reduce GHG emissions through strategies that build on the assets of characteristics of the unincorporated county's diverse communities. In addition to reducing GHG emissions, the strategies in this Plan will provide additional benefits to the

community such as lower energy bills, greater transportation options, improved air quality, expanded economic growth, protection of coastal and redwood resources, and enhanced quality of life.

The EECAP covers the following topics:

- Introduction (**Chapter 1**);
- Scientific and Regulatory Context (**Chapter 2**);
- GHG Emissions Inventory (**Chapter 3**);
- GHG Reduction Strategies (**Chapter 4**);
- Adaptation (**Chapter 5**); and
- Implementation (**Chapter 6**).

To streamline the main document, this Plan includes several technical appendices to provide additional detail and information regarding GHG reductions, costs, and sources. The EECAP includes the following six appendices:

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- Detailed discussion of how this Plan will satisfy BAAQMD requirements for a Qualified GHG Reduction Strategy (**Appendix D – BAAQMD Compliance**);
- An adaptation matrix summarizing key adaptation topics, vulnerabilities, regulatory agencies, and opportunities for mitigation (**Appendix E – Working Adaptation Program**); and
- A checklist to be completed by new project development applicants to demonstrate compliance with the EECAP (**Appendix F – New Development Checklist**).

LOCAL SETTING

San Mateo County covers some of California’s most diverse open spaces as well as part of the Silicon Valley. Almost 75% of unincorporated land is protected open space, wetlands, watersheds, or parks, including

protected redwood forests. Nestled strategically between Stanford University, the University of California San Francisco, the University of California Berkeley, and additional private universities, the unincorporated county has a highly skilled labor force that attracts innovative technology and bioscience industries. San Mateo County is just a 20-minute car drive from San Francisco, and located in close proximity to numerous Bay Area employment centers. The county is bordered by the Pacific Ocean to the west, the City of South San Francisco to the north, and the incorporated cities that border the San Francisco Bay to the northwest and west, including the City of San Mateo and Redwood City. With a generally mild Mediterranean climate, the unincorporated county includes several microclimate zones, with cooler, coastal microclimates along the Pacific Ocean and more moderate climate areas inland.

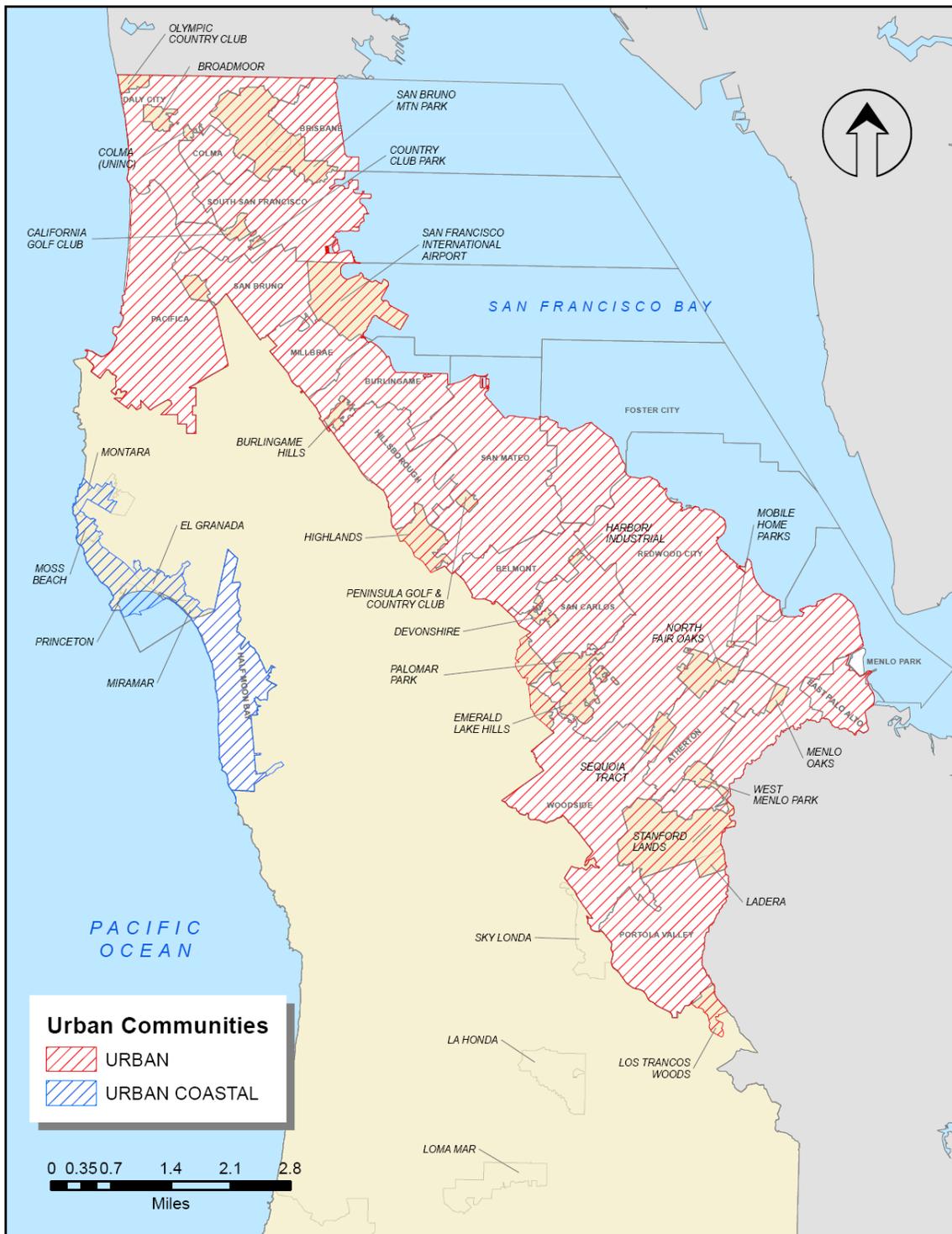
The unincorporated county consists predominantly of rural land and dispersed communities. While the unincorporated county includes over 30 unincorporated communities, five primary communities are governed by County area plans: A map of unincorporated communities is shown in **Figure 1** below. San Bruno Mountain, Emerald Lake Hills, North Fair Oaks, Skyline, and the Coastal Zone. The Coastal Zone consists of 88,800 acres of primarily rural land, with 55 miles of shoreline that includes the communities of Montara, Moss Beach, El Granada, Miramar, Princeton-by-the-Sea, Pescadero, and San Gregorio.

With a strategic location between top Bay Area employment centers, unincorporated county residents tend to commute for work. According to the 2010 US Census (US Census Bureau, 2012), the average travel time of residents in San Mateo County was 25 minutes, just slightly lower than the statewide average of approximately 27 minutes. In general, many residents work outside of the unincorporated county, while many local workers live outside of the county. This leads to longer local commute patterns and daily trips that are highly auto-dependent.

“We have a strong tradition in San Mateo County of protecting our precious natural environments, but being environmentally conscious is not just about setting aside land for parks and open space. It means thinking through the long-term effect of every action, realizing that land use decisions impact air quality, water consumption and quality, and energy use, and understanding that future generations will hold us accountable for the decisions we make today.”

Supervisor Rich Gordon (San Mateo County, 2009)

Figure 1. Communities in San Mateo County



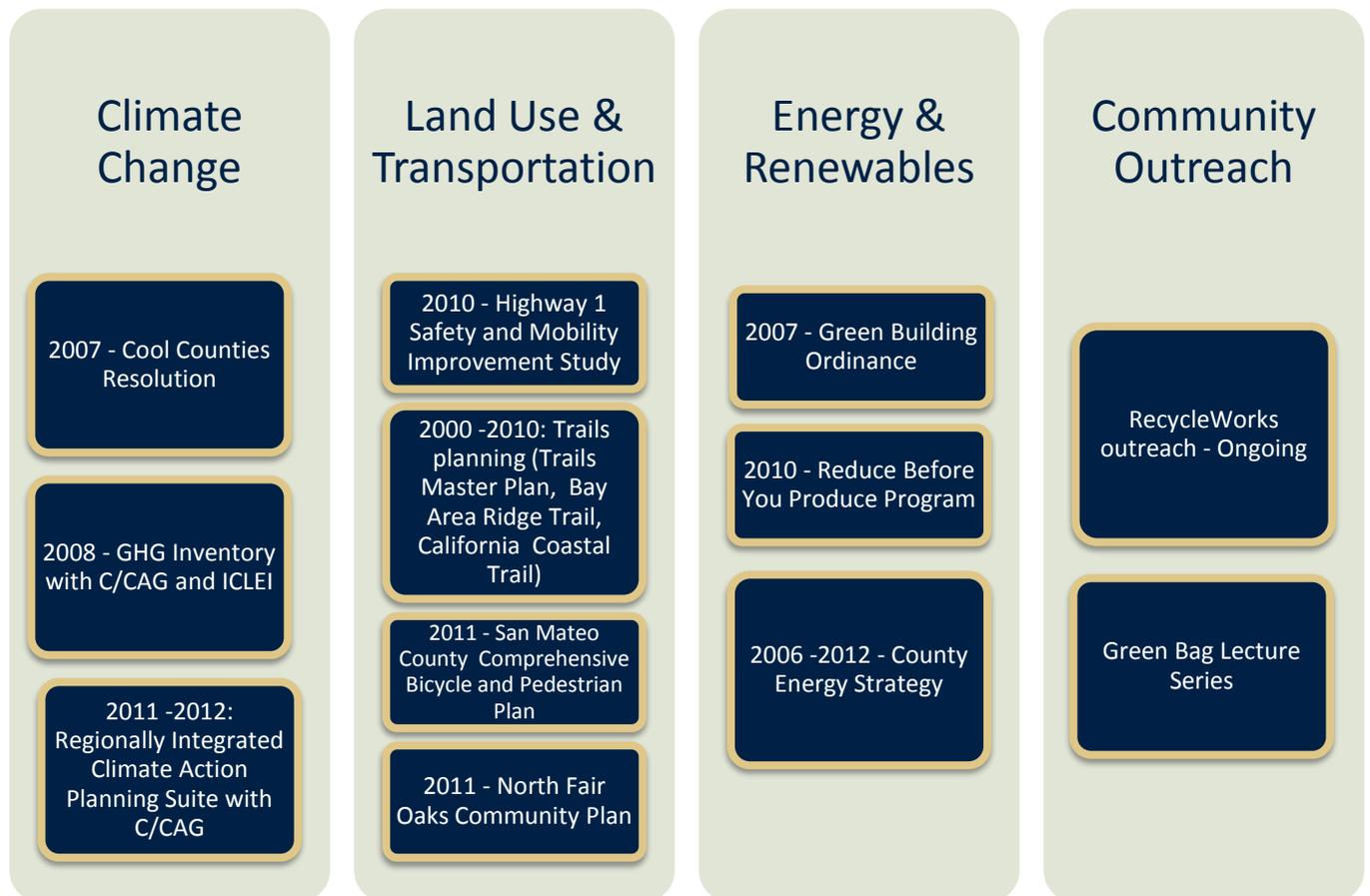
San Mateo County Planning & Building Department | Graphic Section

HISTORY OF CLIMATE PROTECTION EFFORTS

Environmental advocacy has a long history in San Mateo County. Local groups and government agencies have long been involved in the active protection of natural resources and efforts to mitigate the unincorporated county's impact on climate change. The County has implemented numerous proactive climate protection and sustainability programs. In addition to leading by example through government operations, the County has also worked in partnership with the community to achieve common energy and sustainability objectives. Environmental stewardship is a local political, public, and private priority.

On October 16, 2007, the County Board of Supervisors adopted the Cool Counties Declaration, committing the County to inventory GHG emissions and identify mitigations for County operations, work toward a regional reduction target, and advocate for federal action to reduce GHG emissions. While the adoption of the Cool Counties Declaration marked the beginning of the County's direct efforts to achieve reductions in GHG emissions, the County also has an extensive history of conserving resources and encouraging behavioral changes that have mitigated the unincorporated county's impact on climate change. These efforts are summarized below and in **Figure 2**.

Figure 2. History of County Planning Efforts



COUNTY PLANNING EFFORTS

With the adoption of the 1986 General Plan and the 1998 Local Coastal Program, the County has identified numerous policies that provide a framework for GHG emissions reductions. Policies include promotion of renewable energy resources, water conservation, and coordinated land use and transportation planning. The County has further integrated policies into the local planning framework. In 2007, the County adopted a mandatory Green Building Program that applies to new residential buildings, specified residential remodels, and commercial or industrial projects greater than 3,000 square feet. The Green Building Program requires Leadership in Energy and Environmental Design (LEED) certification for residential, commercial, or industrial projects, or 50 GreenPoints or higher on the appropriate GreenPoint Rated Checklist for residential projects. Since 2005, the County has permitted over 100 green building projects through the Green Building Program, for a total of 363,438 square feet of green development.

In 2011, the County adopted the North Fair Oaks Community Plan. Policies in this document govern development in the North Fair Oaks community, an area of approximately 800 acres between Redwood City, Atherton, and Menlo Park. This is the County's most recent major planning effort, and it models the County's vision for livable, healthy, and environmentally sustainable communities. The North Fair Oaks Community Plan provides policies targeted to this urban community that are not appropriate for all areas in the unincorporated county. Nonetheless, the North Fair Oaks Community Plan demonstrates the County's progressive policies to achieve sustainability in its communities. The plan includes policies to achieve a greater mix of land uses, promote integrated transportation for all transportation modes, promote renewable energy, and foster a clear vision for design.

In 2008, the County prepared two GHG emissions inventories with the City/County Association of Governments of San Mateo County (C/CAG) and ICLEI - Local Governments for Sustainability (ICLEI). The County inventoried emissions for the baseline year of 2005 for community activities and government operations. These inventories provided a starting point for the updated community-wide inventory that the County prepared through this EECAP. The County is also currently updating the inventory for government operations.

OTHER PROJECTS AND EFFORTS

In 2009, the County created an Energy Efficiency and Solar Power Roundtable to create an energy efficiency financing program. The group consisted of community members, energy industry representatives, and County staff. Based on the experience of other jurisdictions, the County decided to develop a pilot program that provides education and financial incentives to homeowners: "Reduce Before You Produce." This is a collaborative effort the County is completing in partnership with other jurisdictions. To date, the County has

County Green Building Ordinance & New Construction

Green buildings constructed in San Mateo County since 2005:

112 residential projects totaling 331,492 square feet

5 commercial projects totaling 31,946 square feet

conducted workshops, funded residential energy assessments, and prepared home energy guides for residents.

The County also participated in development of the San Mateo County Energy Strategy 2012. This was a joint regional planning effort between San Mateo County, C/CAG, and representatives on the C/CAG Utilities and Sustainability Task Force, including a representative from Pacific Gas and Electric (PG&E) and one from the Association of Bay Area Governments (ABAG). The document primarily focuses on strategies to reduce municipal energy use but also provides action aimed at reducing community energy use.

The County is also a long-time promoter of recycling and waste reduction opportunities. The San Mateo County Employee Green Team conducts community outreach identified in green strategies for County operations. Green Team members hosted the 2010 Green Bag Lecture series of monthly environmental lunchtime presentations, open to County employees and the public. These meetings were streamed live over the County's website. The County also conducts outreach through RecycleWorks, a San Mateo County program that provides information to residents and businesses on waste reduction and sustainability resources. RecycleWorks hosts events and provides a website with program information, including discounted compost bins, options for disposal of electronic and hazardous waste, and green building and business awards.

In late 2012 the County adopted a Climate Action Plan for County Government Operations. This Plan focuses on energy efficiency measures and efforts to reduce greenhouse gas emissions for County Government Operations that are located both in unincorporated County areas and within incorporated cities such as Redwood City. There are many similarities between the EECAP and the County Operations CAP, both in terms of format and reduction measures. The County Operations CAP also uses a 2005 baseline year for its GHG inventory. Unlike the EECAP, the County Operations CAP has a target of 15% reduction in GHG emissions by 2020, consistent with the state-recommended target. The County Operations CAP was produced in cooperation with C/CAG. More information about this effort can be found here: <http://www.co.sanmateo.ca.us/portal/site/greenportal/>.

PUBLIC PARTICIPATION AND THE PLANNING PROCESS

The San Mateo County Planning staff sustained a highly collaborative process for development of the EECAP. From project kickoff to the first public hearing, the County shaped the EECAP through ongoing collaboration. The public participation process included three County-sponsored community workshops, stakeholder focus group meetings through three separate advisory groups, an online survey, development of a project website, interagency coordination, and numerous conversations with local and regional partners. County staff also mailed out postcards, created a project website and e-mail list, and distributed project updates to invite ongoing input. Since the unincorporated county encompasses a diverse



geography and numerous communities, County staff recognized that ongoing public involvement was critical to obtain representative input.

The engagement process provided a foundation of broad-based input from residents, business interests, County staff, and key stakeholders. The County relied on ongoing participation efforts to develop an effective plan that responds to local priorities and opportunities. Public input also allowed the County to build partnerships that are necessary for implementation of this Plan.



EECAP ADVISORY GROUPS

The project consisted of three advisory groups:

- The Technical Advisory Committee (TAC), including representatives from several County departments. The group met to discuss and review preparation of the inventory and policy development.
- The Steering Committee (SC), including representatives from local environmental groups, building and real estate groups, SamTrans, PG&E, and local groups such as the Committee for Green Foothills and the Sierra Club. The SC convened regularly to discuss local priorities, provide direction for development of the inventory and EECAP policies, and review work products.
- The Vulnerability Assessment Working Group included County staff, as well as stakeholders from public agencies and non-governmental public interest organizations. This group participated in development of the Vulnerability Assessment, convening to identify vulnerability topics and adaptation priorities.

The County also hosted three public workshops throughout the project process, which are described below.

PUBLIC WORKSHOPS

Workshop 1: August 9, 2011, Fair Oaks Community Center, Redwood City

The objective of the first workshop was to educate the community about the purpose and the goals of the EECAP and share the County's existing efforts with meeting attendees. The workshop also sought to collect input on priorities for general energy efficiency and sustainability issues. The County and consultant team provided a technical presentation and facilitated a small group activity and discussions. Workshop participants shared their vision for a sustainable San Mateo County and the challenges and strategies for achieving that vision. Key priorities identified by participants included goals for zero net energy, alternative energy and energy

efficiency, local agriculture, and protection of natural resources. Participants also identified multimodal transportation and efficient land use patterns as important themes.

Workshop 2: November 17, 2011, Senior Center Lodge, Half Moon Bay

The County hosted the second workshop to educate and solicit feedback from the community about climate adaptation in the unincorporated county. This workshop targeted key stakeholders, but the general public was also invited to participate. Participants took part in discussions and brainstormed potential adaptation strategies for the EECAP. Ideas and thoughts shared by attendees included questions on the uncertainty of coastal erosion rates, support for use of County Park forests as demonstrations for carbon sequestration, vulnerabilities of the local water supply, and risks to coastal infrastructure and systems.

Workshop 3: April 10, 2012, County Government Center, Redwood City

At the third workshop, the County shared draft EECAP strategies, which the County developed with the ongoing participation of the Technical Advisory Committee and Steering Committee. The workshop included a presentation, an electronic polling exercise, and an open-house style display of EECAP strategies on posters. Participants assessed the effectiveness of strategies and identified ideas to improve measures. Participants emphasized the importance of different opportunities for the unique microclimates and pockets of communities. A majority of workshop participants identified money as the single greatest challenge to achieve energy efficiency. Many participants also responded that the County could have the greatest impact on GHG reductions through financial incentives (as opposed to education, regulations, pilot projects, and voluntary development incentives).

Workshop Feedback: Eight of ten participants believe that San Mateo County should strive to be a leader in clean energy, energy efficiency, and sustainability.

Based on live polling at Workshop 3, 4/10/2012

RELATIONSHIP TO THE GENERAL PLAN

The San Mateo County General Plan identifies energy efficiency, waste reductions, and efficient land use as priorities for the unincorporated county. The General Plan provides groundwork for greenhouse gas (GHG) emissions reductions. Numerous policies in the General Plan reduce greenhouse gas emissions. Measures, policies, and projects that reduce community-wide GHGs presented in the EECAP are aligned with the goals and policies of the General Plan. As part of development of the EECAP, the County is also identifying subsequent General Plan amendments to integrate new strategies into the County's planning framework. This approach ensures that the County will implement EECAP strategies through ongoing project review.

CEQA AND ENVIRONMENTAL REVIEW

In order to operate effectively as a programmatic tiering environmental document, the California Attorney General's Office and the BAAQMD both recommend integration of components of the GHG emissions reduction strategy into the General Plan. This integration will identify how the GHG emissions reduction strategy operates as a policy and implementation document that is updated every five years to respond to updates in science, technology, and policy. The GHG emissions reduction strategy will contribute to the General Plan's policies and will serve as mitigation for San Mateo County's GHG emissions.

The County has prepared environmental review in compliance with the requirements of the California Environmental Quality Act (CEQA) through development of a Programmatic Environmental Impact Report. This document finds that the EECAP will have a less than significant environmental impact for all impacts analyzed.

PREPARATION OF THIS PLAN

The United States Department of Energy awarded the County an Energy Efficiency and Conservation Block Grant (EECBG) in late 2009. The County used EECBG Program funds for several projects, including development of this Plan. The purpose of the EECBG Program is to empower local communities to make strategic investments to meet the nation's long-term goals for energy independence and demonstrate leadership in climate change by:

- Reducing fossil fuel emissions;
- Reducing the total energy use of eligible entities;
- Improving energy efficiency in transportation, building, and other appropriate sectors; and
- Creating and retaining jobs.

This Plan achieves the intent of the EECBG Program by creating a strategy to reduce community-wide energy use, reduce fuel combustion through more efficient transportation and land use patterns, and spurring growth in local energy efficiency industries.

USE OF THIS PLAN

The EECAP serves as the County's greenhouse gas reduction strategy, commonly referred to as a climate action plan. The Plan is primarily a tool to identify the County's plan to reduce GHG emissions and adapt to climate change locally. But the County will only achieve the goals of this Plan through partnership with the broader community. As a result, the EECAP also serves as an educational document for the community. Members of the public can use the Plan to identify programs and opportunities or learn about local conditions and priorities.

Several highlights for potential EECAP audiences are listed in **Figure 3**.

Figure 3. Highlights of Key EECAP Topics by Stakeholder



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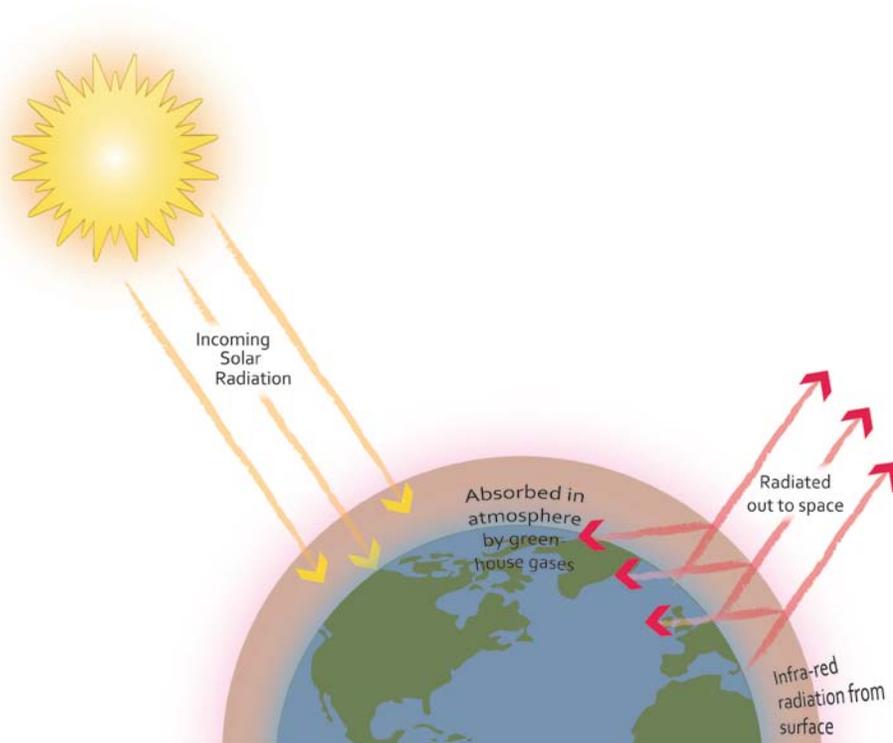
SCIENTIFIC AND REGULATORY CONTEXT

An understanding of the scientific background and regulatory framework under which this Plan has been developed is critical for making meaningful and effective decisions regarding greenhouse gas reductions. This chapter briefly explains the science behind climate change, discusses some of the projected global implications, and describes the regulations that inform the development of this Energy Efficiency Climate Action Plan (EECAP).



CLIMATE CHANGE SCIENCE OVERVIEW

Life on our planet relies on complicated interactions between the earth and radiation from the sun. Several gases in the atmosphere, including water vapor, carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons, function as barriers that trap heat within the planet's atmosphere. These gases, referred to as "greenhouse gases" (GHGs), function similarly to glass on a greenhouse, which allows sunlight to pass into the greenhouse, but retains solar radiation, or heat, within. The term "greenhouse effect" describes the atmospheric captures of heat that would otherwise radiate away from the earth toward space. **Figure 4** illustrates the greenhouse effect.

Figure 4. The Greenhouse Effect

Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. 2008. NOAA Satellite and Information Service.

Scientific consensus holds that human activity is releasing greenhouse gases faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land use changes, and other human activities. Although these gases are also naturally emitted into the atmosphere through non-human sources, human activities have increased significantly the concentration of greenhouse gases beyond natural levels. The overabundance of greenhouse gases in the atmosphere has led to a measurable warming of the earth and is predicted to severely impact the earth's climate system.

While there is a clear upward trend in average global temperature, the term "climate change" is used in this document instead of "global warming." This decision reflects the fact that many climatic variables, in addition to average temperature, are projected to change.

CLIMATE CHANGE IMPACTS

The release of greenhouse gases at or above the current rate will continue to increase average temperatures around the globe. These increases in global temperatures are likely to change our planet's climate in ways that will have significant global, regional, and local long-term effects.

GLOBAL CLIMATE CHANGE IMPACTS

The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report provides a comprehensive synthesis of the world's best climate models.¹ Assuming current emission patterns, the IPCC projects a wide range of global climate change impacts, including the following:

- Warmer days, fewer cold days and nights, and more frequent hot days and nights over most land areas
- Increased frequency of warm spells/heat wave frequency over most land areas
- Increased frequency of heavy precipitation events over most areas
- Increased area affected by drought
- Increased intense tropical cyclone activity
- Increased incidence of extreme high sea level

These impacts will exacerbate extreme weather events and lead to further indirect impacts such as shifting agricultural zones, increased disease vectors, and altered animal migration patterns. The IPCC Fourth Assessment Report notes that if trends remain unchanged, GHG emissions above current rates will induce further warming changes in the global climate system and pose even greater risks. Given the scientific basis of climate change and expected trends, it is imperative to prepare for and mitigate climate change through deliberate global and local action.

LOCAL VULNERABILITY ASSESSMENT

In 2011, the County conducted a climate change vulnerability assessment to:

- Identify the functional systems that are likely to be affected by climate change–related impacts
- Understand the causes and components of each system's vulnerabilities

¹ IPCC 2007

- Identify vulnerable points in the system
- Gather information about the relationships between vulnerabilities of different systems to allow for prioritization and for a systems approach to policymaking

The report identified agriculture and forestry, coastal zone infrastructure, coastal ecosystems, fire-threatened areas, public health, and water and wastewater infrastructure as key topics for assessment. For a full summary of local vulnerabilities in each topic, see **Chapter 5: Adaptation**.

REGULATORY CONTEXT

The EECAP was drafted within a robust federal, state, regional, and local framework. This section highlights the federal and state legislative framework guiding the preparation and implementation of this EECAP.

FEDERAL FRAMEWORK

Current federal regulations lack strict emissions reduction targets. However, the federal government is supporting the emissions reduction efforts of state and local governments in a variety of ways. Numerous efforts are currently under way to limit emissions from power plants, impose pricing on carbon emissions, and provide federal energy efficiency legislation.

Federal agencies have undertaken a concerted effort to assist state and local governments, businesses, and residents with efforts related to energy, climate action planning, and smart growth. The Environmental Protection Agency (EPA) also provides educational resources and analytical tools in support of GHG analysis and climate action planning.

EPA and the Clean Air Act

The Clean Air Act defines the EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The EPA, states, regional agencies, and local governments collaborate to implement programs and enforcement of the Clean Air Act.

In 2009, the EPA Administrator signed two greenhouse gas-related findings under the Clean Air Act, which stated:

- Greenhouse gases such as carbon dioxide, methane, and nitrous oxide in the atmosphere threaten the public health and welfare of current and future generations; and

- Fuel combustion from motor vehicles contributes to the greenhouse gas emissions that endanger public health and welfare.

These findings enabled the EPA and the National Highway Traffic Safety Administration (NHTSA) to implement greenhouse gas emissions standards for vehicles.

As of 2011, the EPA also has the authority to regulate GHG emissions from new power plants and refineries through a set of New Performance Standards (NPS). These regulations will be finalized throughout 2012.

Federal GHG Reduction Initiatives

The federal government is currently employing voluntary and incentive-based programs to curb greenhouse gas emissions through energy efficiency improvements, renewable energy development, methane capture, and improved agricultural practices. In addition to the significant research efforts related to climate change and GHG reductions, programs such as ENERGY STAR, Climate Leaders, and the Smart Way program encourage emission reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

CALIFORNIA LEGISLATIVE FRAMEWORK

The State of California has addressed energy and climate issues for nearly 40 years. In 1988, Assembly Bill (AB) 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for climate change issues in California. There have been numerous subsequent initiatives in California, with the majority of legislation passed between 2000 and now. These initiatives have strengthened the ability of private, public, and nonprofit entities to engage in accurate data collection and have created ambitious targets and regulations that will lead to reductions in greenhouse gas emissions. California's efforts have earned it a reputation as a leader in climate planning strategies in both the nation and the world.

California legislation related to climate change includes Executive Order S-3-05, Assembly Bill 32, and Senate Bill (SB) 375, which direct the State and other local agencies to reduce GHG emissions. These orders and laws are summarized below. In addition to Executive Order S-3-05, AB 32, and SB 375, the State has enacted legislation and policy initiatives related to climate change, transportation and vehicle efficiencies, energy, water, and solid waste. A summary of recent state efforts by topic is provided in **Figure 5**, with a more detailed discussion of recent climate change legislation provided below.

Figure 5. California Regulatory Framework Summary



Governor's Executive Order S-3-05

Executive Order S-3-05 establishes the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the (nonbinding) progressive greenhouse gas emissions reduction targets outlined in the executive order for the state:

- By 2010, reduce greenhouse gas emissions to 2000 levels
- By 2020, reduce greenhouse gas emissions to 1990 levels
- By 2050, reduce greenhouse gas emissions to 80% below 1990 levels

AB 32 – California Global Warming Solutions Act of 2006

Assembly Bill 32, known as the California Global Warming Solutions Act, was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020. Mandatory actions under the legislation to be completed by CARB include:

- Identification of early action items that can be quickly implemented to achieve greenhouse gas reductions. These early action items were adopted by CARB in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.
- Development of a scoping plan to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The California Natural Resources Agency adopted the Scoping Plan in 2008. The Scoping Plan employs a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program. The plan identifies local governments as strategic partners to achieving the state goal and translates the reduction goal to a 15% reduction of current emissions by 2020.
- Creation and adoption of regulations to require the state's largest industrial emitters of greenhouse gases to report and verify their greenhouse gas emissions on an annual basis.

SB 375 – Sustainable Communities & Climate Protection Act of 2008

Senate Bill 375 builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires metropolitan planning organizations (MPOs) to create a Sustainable Communities Strategy (SCS) in their regional transportation plans (RTPs) for the purpose of reducing urban sprawl. Each SCS is required to demonstrate how the region will achieve the greenhouse gas emissions reduction target set by CARB for 2020 and 2035.

OTHER GUIDANCE AND PROGRAMS

STATEWIDE CAP-AND-TRADE PROGRAM

The cap-and-trade program is a central component of the AB 32 Scoping Plan. “Cap-and-trade” is a market-based approach to reducing greenhouse gas emissions. In California, the cap-and-trade program sets an enforceable limit on the amount of emissions that can be produced by large industrial emitters, also known as a “cap”. The agency then authorizes a number of permits that allow additional emissions that can then be traded, bought, or sold. Facilities subject to cap and trade would be allotted permits, which could be traded or sold if unused. Over time, the cap would decrease, requiring facilities to purchase additional permits or reduce emissions. The program started on January 1, 2012, with enforceable compliance obligations applicable to 2013 GHG emissions.

Cap-and-trade programs enable jurisdictions to reduce overall emissions and to encourage investment in cleaner fuels and energy efficiency. The AB 32 Scoping Plan identifies a cap-and-trade program as a key component of California’s climate strategy. California’s cap-and-trade program has been designed by the CARB in conjunction with stakeholders through a multi-year process and calls for a statewide limit on the sources that create 85% of California’s greenhouse gas emissions including electricity generation, large industrial sources, transportation fuels, and residential and commercial use of natural gas. Starting in 2013, the CARB program will regulate utilities and large industrial facilities with a cap 2% below 2012 emissions levels. CARB estimates that the cap-and-trade program will generate about \$1 billion in state revenue from the auction of emissions allowances for 2012-13, and possibly up to \$10 billion annually by 2020.

Several pieces of legislation seek to allocate cap-and-trade revenue for programs that reduce pollution in disproportionately impacted communities, including Assembly Bill 1532, the California Global Warming Solutions Act of 2006: Greenhouse Gas Reduction Fund (AB 1532). Effective January 2012, AB 1532 addresses how funds related to market-based compliance mechanisms, such as cap-and-trade, can be used. The bill requires administering agencies to allocate these funds to measures and programs that meet specific criteria. The bill also stipulates that the California Environmental Protection Agency must develop a method for the identification of priority communities for investment opportunities based on a variety of geographic, socioeconomic, and environmental factors.

At this time, the local impact of cap-and-trade on facilities in unincorporated San Mateo County cannot be accurately predicted or calculated to identify an achievable local GHG reduction to San Mateo County’s GHG emissions. However, the San Mateo EECAP provides a framework to benefit from potential cap-and-trade revenue by identifying and prioritizing programs that could be funded by potential cap-and-trade revenue.

SB 97 – CEQA GUIDELINE AMENDMENTS OF 2007

Senate Bill 97 was adopted in 2007 by the State of California and directed the Governor’s Office of Planning and Research (OPR) to amend the CEQA Guidelines to address greenhouse gas emissions. The CEQA Guidelines prepared by OPR were adopted in December 2009 and went into effect March 18, 2010. Local

governments may use adopted plans consistent with the CEQA Guidelines to assess the cumulative impacts of projects on climate change, if the adopted plan includes a certified environmental impact report (EIR) or adoption of an environmental document. In order to benefit from the streamlining provisions of the CEQA Guidelines, a plan for the reduction of greenhouse gas emissions must accomplish the following:

- 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
- Be adopted in a public process following environmental review

In response to the updated CEQA Guidelines, the Bay Area Air Quality Management District (BAAQMD) has adopted thresholds of significance for greenhouse gas emissions. These thresholds are used in the environmental review process for plans and projects by local governments and may streamline the environmental review process.

BAAQMD GUIDANCE AND CEQA TIERING

The Bay Area Air Quality Management District CEQA Air Quality Guidelines were developed to assist lead agencies in evaluating air quality impacts for projects and plans in the San Francisco Bay Area Air Basin. The guidelines were updated in 2010 to include guidance on assessing greenhouse gas and climate change impacts as required under CEQA Guidelines Section 15183.5(b) and to establish thresholds of significance for impacts related to greenhouse gas emissions. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project's impact on GHG emissions is less than significant if it is in compliance with a Qualified Greenhouse Gas Reduction Strategy. This EECAP meets the programmatic threshold of the BAAQMD guidelines.

This EECAP follows both the CEQA Guidelines and the BAAQMD guidelines by incorporating the standard elements of a Qualified GHG Reduction Strategy. **Appendix D** describes in detail how the County's Energy

Efficiency Climate Action Plan satisfies the BAAQMD's requirements for a Qualified GHG Reduction Strategy and will allow future development projects to determine that a project has a less than significant impact on GHG emissions if it complies with the County's EECAP.

It is worth noting that the County intends for this CAP to satisfy the BAAQMD's requirements for a Qualified GHG Reduction Strategy. In contrast, some visionary climate action plans prepared by other jurisdictions may establish a target for GHG reduction that is numerically significantly higher than that proposed in the County's EECAP, but these other climate action plans may have trouble satisfying BAAQMD's requirements for a Qualified GHG Reduction Strategy.

REGIONAL PARTNERSHIPS

The County is actively involved in regional energy and sustainability planning. This commitment to regional partnerships helps maximize the efforts of municipal, county, regional, nonprofit, and public utility entities. The following efforts provided a foundation for the development of the EECAP and offer opportunities for future dialogue.

SAN MATEO COUNTY ENERGY STRATEGY 2012

Created by the County of San Mateo Utilities and Sustainability Task Force, with support from the County of San Mateo, City/County Association of Governments (C/CAG), and BAAQMD, the San Mateo County Energy Strategy 2012 is a guidance document that identifies general energy reduction strategies appropriate for San Mateo County, regional organizations, and municipalities. While most goals, strategies, and actions focus on reducing municipal energy use, several actions aim to reduce community energy use, including:

- Reduce or eliminate permitting fees for the investment of clean energy systems
- Adopt green building standards and ordinances
- Provide financial incentives and rebates for water-conserving products
- Update general plans and municipal codes to include water conservation policies
- Consider incentives for businesses to achieve Green Business Certification

After releasing the document, C/CAG provided additional educational materials to cities and the County and provided incentives to promote the completion of government operation inventories for cities in the county.

SAN MATEO COUNTY ENERGY WATCH

San Mateo County Energy Watch is a partnership between C/CAG and Pacific Gas and Electric (PG&E). The program's goal is to reduce energy usage through energy efficiency in San Mateo County cities and unincorporated areas. San Mateo County Energy Watch provides energy efficiency services to public agencies, nonprofits, small businesses, and residential customers. These program elements include:

- A direct-install program for lighting and refrigeration measures for public agencies, nonprofits, and small businesses
- Comprehensive audits for public agencies and nonprofits
- Technical assistance for more complex energy efficiency projects for public agencies and nonprofits through PG&E's Customized Retrofit Incentives program
- A direct-install program for lighting and weatherization measures for moderately low-income residents
- Climate action program assistance for cities and the County
- Energy efficiency training and education workshops and classes

As part of the Energy Watch program, PG&E and BAAQMD have provided support to C/CAG to develop the Regionally Integrated Climate Action Planning Suite (RICAPS). The County provides standardized tool kits for cities and towns in San Mateo County to create climate action plans. Tool kits include inventory tools, suggestions for quantified reduction measures, and climate action plan language. C/CAG and the County have been actively engaged in the development of these tools.

INDICATORS FOR A SUSTAINABLE SAN MATEO COUNTY

Indicators for a Sustainable San Mateo is an annual report published by Sustainable San Mateo County (SSMC). SSMC has been producing reports for 15 years with the goal of raising awareness of sustainability in San Mateo County. The report tracks 30 countywide economic, social, and environmental issues. Additionally, the report provides regional benchmarks that illustrate San Mateo County data relative to other Bay Area counties. The 2011 report provides regional benchmarks for indicators such as unemployment rates, vehicle miles traveled (VMT) per capita, and GHG emissions per capita.

GHG EMISSIONS INVENTORY

A greenhouse gas emissions inventory (Inventory) lays the groundwork for the entire EECAP planning process. This Inventory catalogues greenhouse gas emissions for 2005, then projects emissions levels for 2020 and 2035. In order to comply with state guidance, the EECAP identifies emissions reduction targets for 2020. The difference between the emissions projection and the reduction target is the amount of greenhouse gas emissions that need to be reduced.



INVENTORY PURPOSE AND BACKGROUND

In 2008, the County conducted a 2005 baseline year community-wide GHG emissions inventory for the unincorporated areas of San Mateo County. Changes to the regulatory structure and incentives to address GHG emissions have prompted the County to re-inventory emissions from community-wide sources. This greenhouse gas emissions inventory (Inventory) is a new assessment of GHG emissions in the unincorporated county. For a full discussion of changes to the regulatory structure and inventory method, see **Appendix B**.

The County is aiming to reduce projected emissions at least **15%** below baseline emissions level by 2020. Implementation of this EECAP is projected to reduce emissions by **17%**, providing a 2% buffer beyond the 15% requirement.

Accounting for state programs, this reduction target is equal to a **6%** reduction below forecast emissions by **2020** and **46%** by **2035**.

This Inventory provides a foundation for the County's Energy Efficiency Climate Action Plan (EECAP; Plan), identifies the major sources and quantities of GHG emissions caused by activities within the unincorporated boundary of San Mateo County,² and provides a baseline against which future progress can be measured. Specifically, this Inventory:

- Presents GHGs from community-wide activities in calendar year 2005;
- Forecasts how community-wide emissions will increase by 2020 and 2035 if no behavioral or regulatory changes are made;
- Adjusts the GHG forecasts to account for reduction efforts mandated by the State of California (State); and
- Provides adequate information to direct development of EECAP reduction measures.

The Inventory includes all major sources of GHGs caused by activities in the unincorporated county and is consistent with the method recommended by the California Air Resources Board (CARB), ICLEI-Local Governments for Sustainability, and the Bay Area Air Quality Management District (BAAQMD). The Inventory analyzes the following emissions sources:

- Energy – electricity, natural gas, and residential propane consumed in the unincorporated county in 2005
- Transportation – vehicle miles traveled (VMT) to and/or from the unincorporated county in 2005
- Waste – methane emissions from waste sent to landfills from the community in 2005
- Landfills – direct emissions from landfills in 2005
- Water and Wastewater – the energy required to extract, filter, move, and treat the water consumed and/or treated in the unincorporated county in 2005
- Stationary Sources – direct emissions from industrial processes in the unincorporated county that are permitted by the BAAQMD

In 2005, **transportation** accounted for over **60%** of all emissions in the county.

Commercial and residential energy use accounted for another **28%** of all emissions in the county.

² This Inventory focuses on community-wide emissions in the unincorporated county only. The County is currently conducting a parallel project to update the GHG emissions inventory for County government operations.

- Off-Road – emissions from construction, and lawn & garden equipment/vehicles
- Agriculture – emissions from fertilizer and agricultural off-road equipment/vehicles

The GHG emissions inventory starts with collecting activity data for each sector listed above, such as the kilowatt-hours (kWh) of electricity or therms of natural gas used for the residential, commercial, and industrial energy sectors, the vehicle miles traveled for the transportation sector, or million gallons (MG) of water used by the community in a single calendar year. These activities are converted into GHG emissions using an emissions factor or coefficient.

The Inventory measures three primary GHG emissions—carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). These GHGs are then converted to carbon dioxide equivalents (CO₂e), enabling the County to consider different greenhouse gases in comparable terms. The conversion of greenhouse gases is done by comparing the global warming potential (GWP) of each gas to CO₂. For example, methane is 21 times more powerful than CO₂ on a per weight basis in its capacity to trap heat, and therefore one metric ton of CH₄ would be calculated as 21 metric tons of CO₂e.

2005 COMMUNITY BASELINE INVENTORY RESULTS

This section provides a brief overview of baseline emissions in the unincorporated county. In 2005, the unincorporated county emitted approximately 905,090 MTCO₂e. **Table 1** reports MTCO₂e by sector, rank of sector, and sector percentage of overall unincorporated county GHG emissions.

Table 1. 2005 Community-Wide Baseline Emissions by Sector

| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|---------------------------------------|------------------------|
| Transportation | 479,400 | 52% |
| Commercial and Industrial Energy | 160,900 | 18% |
| Landfill | 123,000 | 14% |
| Residential Energy | 93,100 | 10% |
| Off-Road | 35,800 | 4% |
| Solid Waste | 8,380 | 1% |
| Agriculture | 3,000 | <1% |
| Water and Wastewater | 1,500 | <1% |
| Stationary | 10 | <1% |
| TOTAL | 905,090 | |

** Due to rounding, the total may not be the sum of component parts.*

Table 1 reports stationary and direct landfill emissions. Stationary sources are fixed emitters of air pollutants, such as power plants, stationary generators, petrochemical plants, and other heavy industrial sources. Since stationary source emissions are influenced by market forces beyond the County's local influence and are best regulated by the BAAQMD or through federal and state programs, they are reported in this Inventory for informational purposes only. Similarly, the County has limited control over the operation of landfills in the unincorporated county and is unable to directly affect the emissions generated from previously generated waste. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the County's influence; therefore, stationary sources and direct landfill emissions are excluded from all further discussions in this Inventory. Also, GHG reduction due to landfill gas recapture is included as a supportive measure in the list of GHG reduction strategies, but is not quantified and is not included in the GHG emissions reduction target calculations.

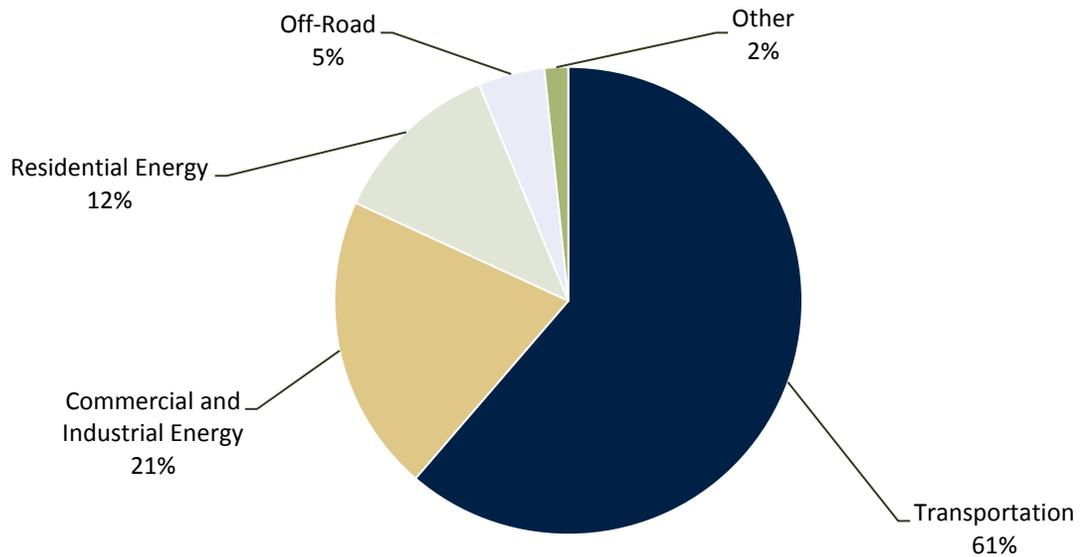
With stationary sources and direct landfill emissions removed from the Inventory, approximately 782,080 MTCO₂e were emitted in San Mateo County in 2005. **Table 2** reports MTCO₂e by sector, rank of sector, and sector percentage of unincorporated county GHG emissions, excluding stationary sources and direct landfill emissions. **Figure 6** summarizes the percentage of overall GHG emissions by sector.

Table 2. 2005 Community-Wide Baseline Emissions by Sector (Excluding Stationary Sources and Direct Landfill Emissions)

| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|------------------------------------|---------------------|
| Transportation | 479,400 | 61% |
| Commercial and Industrial Energy | 160,900 | 21% |
| Residential Energy | 93,100 | 12% |
| Off-Road | 35,800 | 5% |
| Solid Waste | 8,380 | 1% |
| Agriculture | 3,000 | <1% |
| Water and Wastewater | 1,500 | <1% |
| TOTAL | 782,080 | |

** Due to rounding, the total may not be the sum of component parts.*

Figure 6. 2005 Community-Wide Baseline Emissions by Sector (Excluding Stationary Sources and Direct Landfill Emissions)



** Due to rounding, the total may not be the sum of component parts.*

GHG EMISSIONS FORECAST

A GHG emissions forecast is an estimate of future GHG emissions based on anticipated changes in population, jobs, households, commercial activity, and driving patterns. This GHG emissions forecast of community-wide emissions focuses on two target years: 2020 and 2035. The 2020 year is estimated for consistency with Assembly Bill (AB) 32 targets; the year 2035 is estimated for consistency with Senate Bill (SB) 375.

BUSINESS-AS-USUAL EMISSIONS

A “business-as-usual” (BAU) projection is an estimate of how emissions would grow over time without influence from state, regional, and local reduction efforts. This BAU assumes 2005 energy consumption and energy efficiency rates and incorporates demographic information from the Association of Bay Area Governments (ABAG) 2009 regional forecasts of populations, households, and jobs along with estimated growths in off-road equipment and vehicle miles traveled (VMT). As shown in **Table 3**, emissions are anticipated to grow 10% from 2005 to 2020 and 19% from 2005 to 2035.

Table 3. 2020 and 2035 Business-as-Usual GHG Forecast (MTCO₂e)

| Sector | 2005 Baseline | 2020 | 2035 |
|----------------------------------|---------------|---------|---------|
| Transportation | 479,400 | 506,800 | 534,200 |
| Commercial and Industrial Energy | 160,900 | 194,600 | 226,300 |
| Residential Energy | 93,100 | 100,500 | 104,200 |
| Off-Road | 35,800 | 44,600 | 53,900 |
| Solid Waste | 8,380 | 9,500 | 10,400 |
| Agriculture | 3,000 | 3,100 | 3,400 |
| Water and Wastewater | 1,500 | 1,700 | 1,900 |
| TOTAL | 782,080 | 860,800 | 934,300 |
| Percentage Change from 2005 | | 10% | 19% |

ADJUSTED FORECAST TO INCORPORATE EXISTING STATE AND LOCAL PROGRAMS

The State has been proactive in reducing GHG emissions. Regulations affecting vehicle standards, building standards, and the renewable energy content of electricity will reduce GHG levels in the unincorporated county. The state actions summarized below are incorporated into the BAU forecast to create a more realistic estimate of the county's future emissions. This adjusted business-as-usual (ABAU) forecast is detailed in **Table 4**. Additional details on the adjusted forecast are provided in **Appendix B**.

Relevant State Actions

California Building Code, Title 24

Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. The 2010 triennial edition of Title 24 pertains to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This Energy Efficiency Climate Action Plan focuses on two sections of Title 24: Part 6 (the California Energy Code) and Part 11 (the California Green Building Standards Code). These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to

Title 24 that yield regular increases in mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction.

AB 1493 (Pavley) Vehicle Standards

California's Pavley regulations were established by AB 1493 in 2002. They require new passenger vehicles to reduce tailpipe GHG emissions from 2009 to 2020. Emissions reductions per model year and vehicle class were applied to San Mateo County's transportation emissions.

California Solar Initiative (CSI)

The CSI is a state program that provides cash rebates for the installation of an electric solar panel system.

California's Renewables Portfolio Standard (RPS)

The RPS mandates that 33% of electricity delivered in California is generated by renewable sources like solar, wind, and geothermal by 2020. Despite the 2020 goal of California's RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

Low Carbon Fuel Standard (LCFS)

The LCFS calls for the California Air Resources Board to achieve a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020. A preliminary injunction was issued in December 2011, which required implementation of the LCFS to be put on hold. CARB is currently appealing the decision. Until the legal standing of the program has been resolved, the LCFS will not be considered in the ABAU forecast.

IMPACT OF STATE REDUCTIONS

As shown in **Table 4**, state reduction efforts are anticipated to reduce BAU emissions by 146,400 MTCO₂e in 2020 and 225,200 MTCO₂e in 2035. The majority of these reductions are from the AB 1493 (Pavley) standards and cleaner energy production standards that PG&E is implementing pursuant to the statewide Renewable Portfolio Program. In comparison to the BAU scenario, 2020 emissions with state reduction measures are 9% below baseline 2005 levels rather than 10% above. Similarly, 2035 emissions go from 19% above baseline 2005 levels in the business-as-usual scenario to 9% below baseline levels after state efforts are taken into account.

Table 4. Summary of GHG Forecast Adjusted for State Actions

| | 2020 | 2035 |
|-----------------------------------------------------|----------|----------|
| Business-as-Usual Emissions | 860,800 | 934,300 |
| California Green Building Standards Code (CALGreen) | -4,500 | -13,300 |
| AB 1493 (Pavley) Vehicle Standards | -130,700 | -194,700 |
| California Solar Initiative (CSI) | -300 | -200 |
| California's Renewables Portfolio Standard (RPS) | -10,900 | -17,000 |
| Subtotal of State Reduction Efforts | -146,400 | -225,200 |
| Net Emissions* | 714,400 | 709,100 |
| Percentage Change from 2005 | -9% | -9% |

GHG REDUCTION TARGETS

The County is committed to achieve a 17% reduction below baseline emissions levels by 2020. The County's target exceeds the AB 32-recommended reduction target of 15% below baseline emissions level by 2020. The measures contained in this EECAP present a way of measuring the Plan's progress toward the County's 17% reduction target.

STATE-RECOMMENDED 2020 AND 2035 REDUCTION TARGETS

The County's GHG reduction target is consistent with the GHG reduction target adopted by the State through the Global Warming Solutions Act (AB 32). AB 32 calls for a reduction of 15% below current (2005–2008) levels as the local government equivalent of 1990 GHG emissions levels.

The State has not adopted GHG reduction targets beyond 2020; however, in 2005, then-Governor Schwarzenegger signed Executive Order S-3-05, which created a goal to reduce GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. An 80% reduction below 1990 levels is equivalent to a 95% reduction below 2005 levels by 2050. These state targets also satisfy also the BAAQMD's California Environmental Quality Act (CEQA) compliance guidelines.

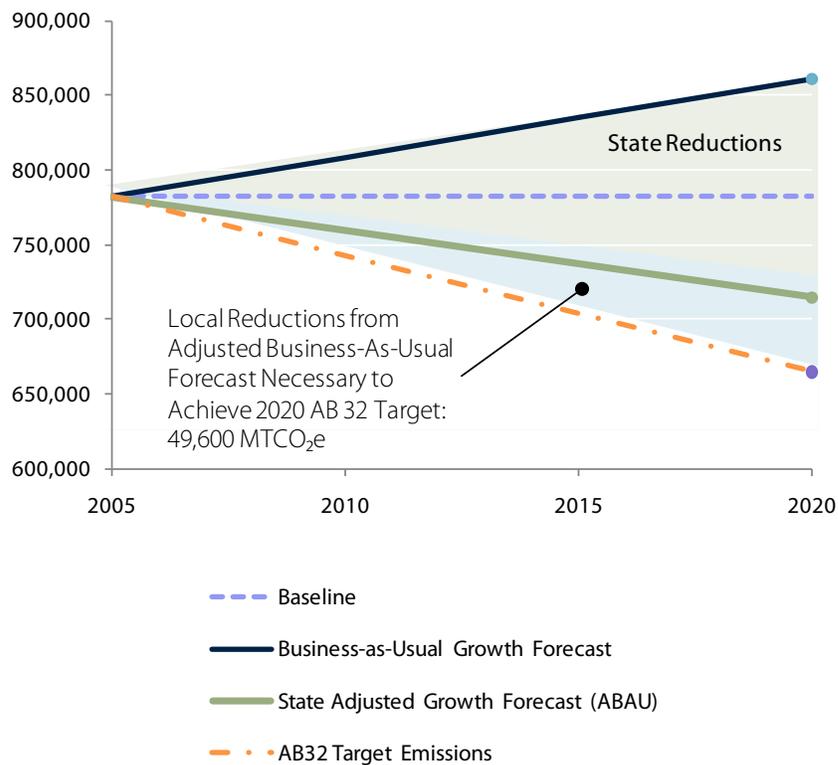
As shown in **Table 5**, the County would need to facilitate a 7% reduction in emissions to meet the AB 32 Scoping Plan goal of 15% below 2005 levels by 2020. Similarly, to accomplish the Executive Order S-3-05 target for 2050, the County would need to reduce emissions 50% by 2035.

Table 5. San Mateo County GHG Emissions & State Reduction Targets

| | 2005 | 2020 | 2035 |
|---------------------------------------------------------------------|---------|---------|---------|
| San Mateo County Adjusted Business-as-Usual Forecast | 782,080 | 714,400 | 709,000 |
| State Reduction Targets | 782,080 | 664,800 | 351,900 |
| Local MTCO ₂ e Reduction Necessary to Meet State Targets | – | 49,600 | 357,100 |
| Percentage of Local Reduction Necessary to Meet State Targets | – | 7% | 50% |

Figure 7 shows the County’s reduction forecasts in relation to baseline and State-recommended reduction targets. The distance between the “ABAU Forecast” line and the “State Reduction Target” line represents the State-recommended MTCO₂e reductions to achieve by 2020. However, the ultimate goal of this EECAP is a 17% reduction below baseline by 2020. Forecasts for 2035 demonstrate the ongoing statewide reduction trajectory based on Executive Order S-3-05.

Figure 7. San Mateo County Forecast Summary and Reduction Targets



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GHG REDUCTION STRATEGIES

This chapter identifies the County's proactive efforts to assess unique risks in the county and to adapt to the long-term impacts of climate change.



REDUCTION STRATEGY STRUCTURE

In order to achieve the County's reduction target of 17% below 2005 emissions levels by 2020, the County of San Mateo will need to implement the goals, policies, and actions set forth in this chapter. This EECAP exceeds the State-recommended 15% reduction target and is intended to satisfy the requirements of the BAAQMD for a Qualified GHG Reduction Strategy. The County's strategy is structured around the following eleven topic areas:

- 1) Residential Energy Efficiency
- 2) Commercial Energy Efficiency
- 3) Green Building Ordinance
- 4) Renewable Energy
- 5) Transportation
- 6) Alternative Fuels
- 7) Waste Diversion
- 8) Water Efficiency
- 9) Sustainable Agriculture Practices
- 10) Off-Road Technology
- 11) Sequestration

Each topic area has a corresponding goal, reduction measures, and supporting actions necessary for implementation.

While many of the reduction measures and actions will result in further reductions in emissions from municipal operations, the County has initiated a separate, more detailed reduction strategy for municipal operations that will identify operational changes, capital projects, and equipment or vehicle upgrades necessary to create the desired emissions reductions. This County Government Operations CAP is more fully discussed in **Chapter 1** of this EECAP, Introduction, and this CAP can be found at: <http://www.co.sanmateo.ca.us/portal/site/greenportal/>.

GHG REDUCTION MEASURE DEVELOPMENT

The development of GHG reduction measures was an interactive process with multiple levels of review and refinement. This process included an assessment of existing activities and ongoing involvement of County planning staff, advisory committees, and the public.

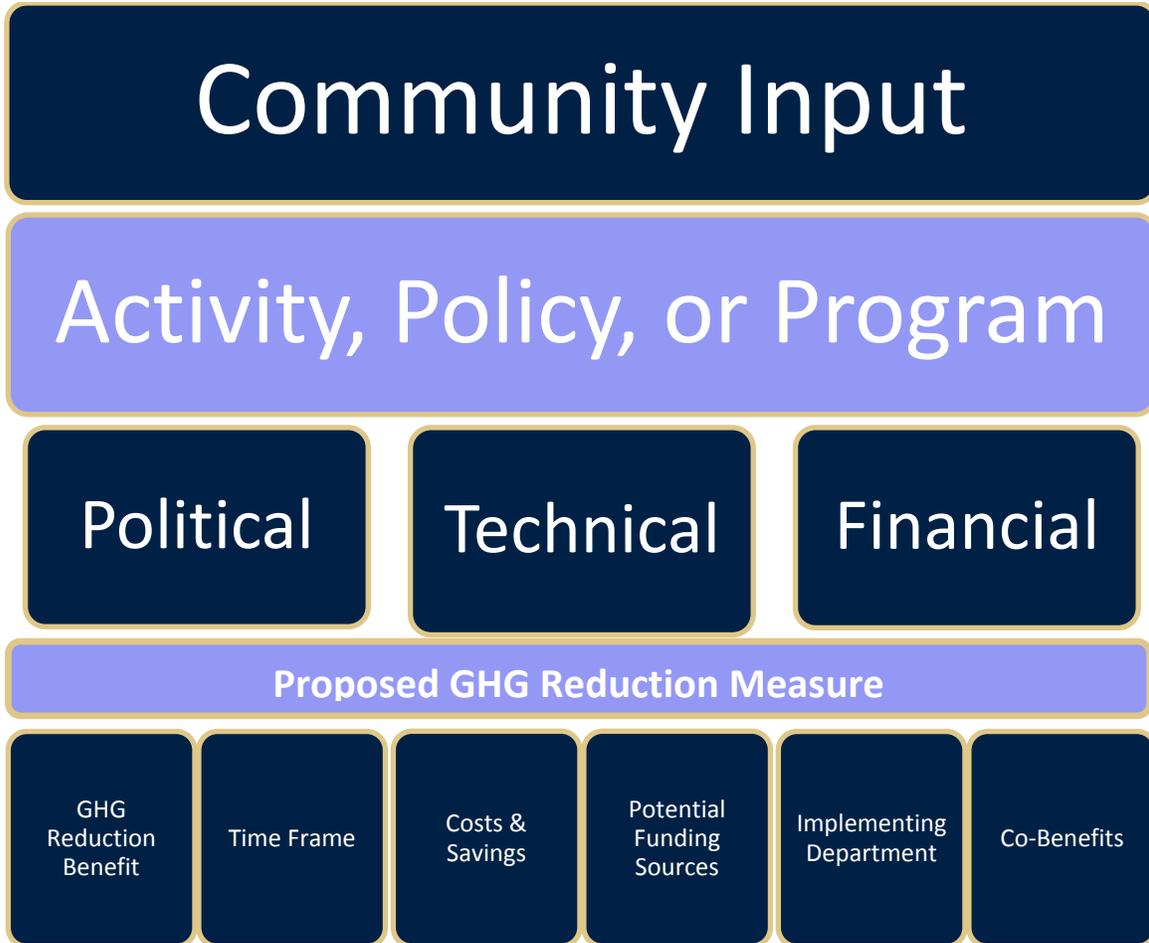
PROCESS FOR DEVELOPMENT OF REDUCTION MEASURES

The preparation of reduction measures relied on the ongoing involvement of key County planning staff, stakeholders, and the public. The development process started with a review of existing policies, activities, and programs in the unincorporated county. Through work with County planning staff, the Technical Advisory Committee (TAC), and Steering Committee (SC), the project team identified preliminary goal topics and draft reduction measures. The TAC and SC directed the refinement of goals and reduction measures through ongoing meetings with the consultant team. Through these meetings, the TAC and SC also reviewed the feasibility of measures and confirmed appropriate targets for implementation.

Reduction measures were developed in coordination with the countywide Regionally Integrated Climate Action Planning Suite (RICAPS) project, an effort led by the County of San Mateo Public Works Department and the City/County Association of Governments of San Mateo County (C/CAG). The RICAPS effort provides a countywide menu of reduction measures and tools for GHG quantification. The reduction measures contained in the Energy Efficiency Climate Action Plan (EECAP; Plan) are consistent with the RICAPS work. However, this Plan builds on the regional templates to provide customized strategies that implement local planning efforts and develop unique goals and opportunities for the unincorporated county. This Plan provides an example to other jurisdictions working to build on the RICAPS project.

Preliminary measures that were developed with the TAC and SC were then refined through the community engagement process and were evaluated for political, technical, and financial feasibility (see **Figure 9**). The final piece to developing each GHG reduction measure involved the identification of how each policy will be successfully implemented by determining the GHG reduction benefit, the time frame for implementation, the estimated costs and savings to the community and the County, potential sources of funding, the department responsible for implementation, and the additional benefits, or co-benefits, that may occur from implementation of each measure.

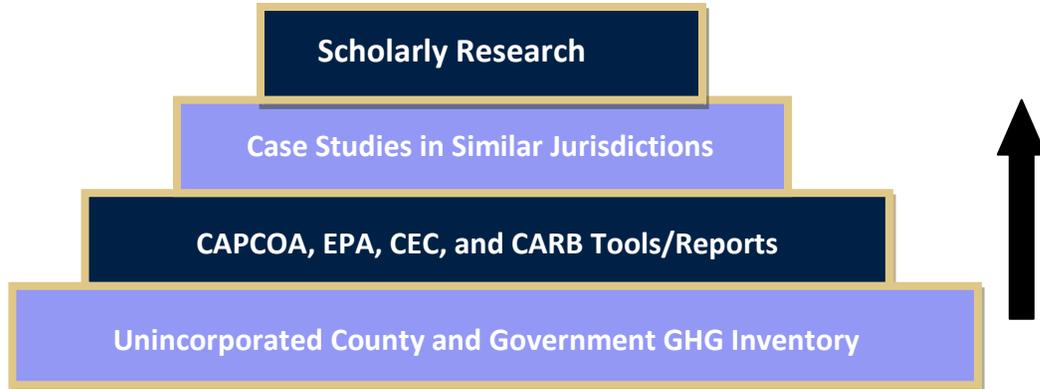
Figure 8. GHG Reduction Measure Development Process



METHOD FOR PREPARATION OF REDUCTION MEASURES

The GHG reduction benefit of each measure is determined by a change in operation, activity, or efficiency. In general, there are three types of reductions in climate action plans: (1) avoided emissions, (2) greater efficiency, and (3) sequestration. GHG reduction estimates are identified for 2020 and 2035.

The information used to estimate GHG emissions reductions is summarized in **Figure 9**. The baseline GHG inventory and forecast serve as the foundation for quantifying the County’s GHG reduction measures. Activity data from the inventory, such as vehicle miles traveled and kilowatt-hours (kWh) of electricity, is combined with the performance targets and indicators identified in this Plan to calculate the GHG reduction benefit of each measure. This approach ensures that the County’s GHG reductions are tied to the baseline and future activities that are actually occurring in San Mateo County.

Figure 9. GHG Quantification Sources and Tools

Whenever possible, emissions reduction estimates are based on tools and reports provided by government agencies such as the US Environmental Protection Agency (EPA), California EPA, California Energy Commission (CEC), California Air Resources Board (CARB), California Air Pollution Control Officers Association (CAPCOA), and local air districts. If accurate reduction estimates are not available through these tools, a case study may be used if the case study is comparable to the conditions in San Mateo County. Finally, for more long-range reduction measures that lack actual on-the-ground testing or analysis, current scholarly and peer-reviewed research is combined with knowledge of existing County practices to create a defensible estimate of future emissions reductions.

To demonstrate the types of information and performance indicators that go into quantifying each measure, a detailed example calculation is provided below in **Table 6**.

Table 6. Example Measure Quantification

| Example Measure: Implement residential energy efficiency program. | | | |
|--------------------------------------------------------------------------|---------------------------------------------------|-------------------|----------------------------------|
| | Quantification Data | Year: 2020 | Data Source |
| A | Total residential electricity use (kWh) | 600,000,000 | Example GHG Inventory Forecast |
| B | Total households | 100,000 | US Census Data |
| C | Average electricity use per household | 6,000 | Calculation = A/B |
| D | Percentage of households participating in program | 5% | Measure goal |
| E | Total households participating in program | 5,000 | Calculation = B*D |
| F | Average electricity savings per participant | 5% | Case studies from cities A and B |
| G | Total electricity savings | 1,500,000 | Calculation = C*E*F |
| H | Metric ton of CO ₂ e per kWh | 0.0002 | Example City GHG Inventory |
| I | Emissions reduction (MTCO ₂ e) | 300 | Calculation = G*H |

The method for determining the GHG reduction benefit from each measure is detailed in **Appendix C**, which summarizes the sources and assumptions used to estimate the GHG reductions from each measure.

EVALUATION CRITERIA

In order to ensure successful implementation and evaluation of the GHG reduction measures included in this Energy Efficiency Climate Action Plan, the following criteria have been identified in this Plan or the associated implementation matrix:

- Implementation Time Frame
- Cost to the County
- Cost to the Community
- Potential Funding Sources
- Implementing Department
- Supporting Agencies
- Community Co-Benefits

Implementation Time Frame will be identified for each measure based on community priorities, local goals, and the availability of technological innovations to implement each measure. Time frames will be presented as a range similar to the following:

| | |
|-------------------|------------------------------------------------------|
| Time Frame | Year Range |
| Ongoing | Existing effort that will continue to be implemented |
| Near-Term | Implemented between 2012 and 2015 |
| Mid-Term | Implemented no later than 2020 |
| Long-Term | Implemented by 2035 |

Cost to the County estimates the average annualized public cost to new infrastructure, services, or programs. For some types of measures, particularly land use measures, it may not be possible to calculate all cost components within the scope of this Plan. Strategies for which a cost estimate cannot be provided are noted. These cost estimates are provided as a range or scale to emphasize the estimated nature of this indicator and allow for cross-sector comparisons.

Cost to the Community is included when applicable. Community costs are presented as average annual costs, representing the added costs for purchasing or incorporating more expensive, energy-saving materials and technology such as equipment to reduce or monitor energy use and renewable energy installations. It is anticipated that any added costs identified in this analysis should be offset through future energy, fuel, water, or other savings, providing monetary savings that outweigh the added upfront costs. These cost estimates are provided as a range or scale to emphasize the estimated nature of this indicator and allow for cross-sector comparisons. In general, costs are primarily presented for energy reduction measures, where there is greater certainty and information related to measure implementation, financial investment, and savings.

The following cost ranges are utilized for both the costs to the County and to the community:

| Costs (\$) | Range |
|-----------------|-------------|
| 0 | Minimal |
| 1–25,000 | Low |
| 25,001–100,000 | Low-Mid |
| 100,001–200,000 | Medium |
| 200,001–500,000 | Medium-High |
| Over 500,000 | High |

Estimated costs to the County and community are summarized in **Appendix C**.

Implementing Department will identify the County department (s) that will be responsible for implementing each measure, securing funding resources, reporting on annual progress, and coordinating with the supporting agencies. These include, for example, County Manager, Planning and Building, Public Works and Parks, Health, Agriculture, Housing, Environmental Health, and Revenue Services.

Supporting Agencies and Non-Governmental Partners (Partners) are the public and private local and regional entities that will be a partner or lead in the implementation of certain actions. Examples of supporting agencies and partners with the County of San Mateo include the Regional Climate Protection Agency, San Mateo County Waste Management Agency, SamTrans, City/County Association of Governments (C/CAG), Joint Venture Silicon Valley, El Concillo, Pacific Gas and Electric (PG&E), or the San Mateo County Chamber of Commerce. In most cases, partners would not be required to implement actions or measures. Instead, the County must often rely on a cooperative partnership arrangement with these entities.

Community Co-Benefits will be included to identify the ancillary benefits that each measure may have for the community. These benefits will be noted throughout the EECAP with icons as shown below.



Conserves Energy



Improves Air Quality



Improves Public Health



Supports Local Economy



Reduces Water Use



Provides Educational Opportunities



Provides Monetary Savings



Improves Mobility



Promotes Equity



Protects Natural Resources

GHG REDUCTION STRATEGIES

GOAL 1: RESIDENTIAL ENERGY EFFICIENCY

Maximize the energy efficiency of existing residential buildings.

Over 20,000 homes exist throughout diverse residential communities in the unincorporated county. Although San Mateo County communities generally enjoy a mild climate, pockets of rural areas rely on both natural gas and propane for home heating. According to the 2010 Census (US Census Bureau, 2012), over 60% of homes in the unincorporated county were constructed before 1970, the date of adoption of the state's first mandatory energy efficiency standards for new construction. A map of older communities in the unincorporated county is shown in **Figure 10**. Older homes generally have a larger opportunity to improve levels of comfort through energy efficiency improvements. In general, the county's inland communities have older housing stock than the newer coastal communities, providing more significant retrofit opportunities that will be targeted through the measures identified under this goal.

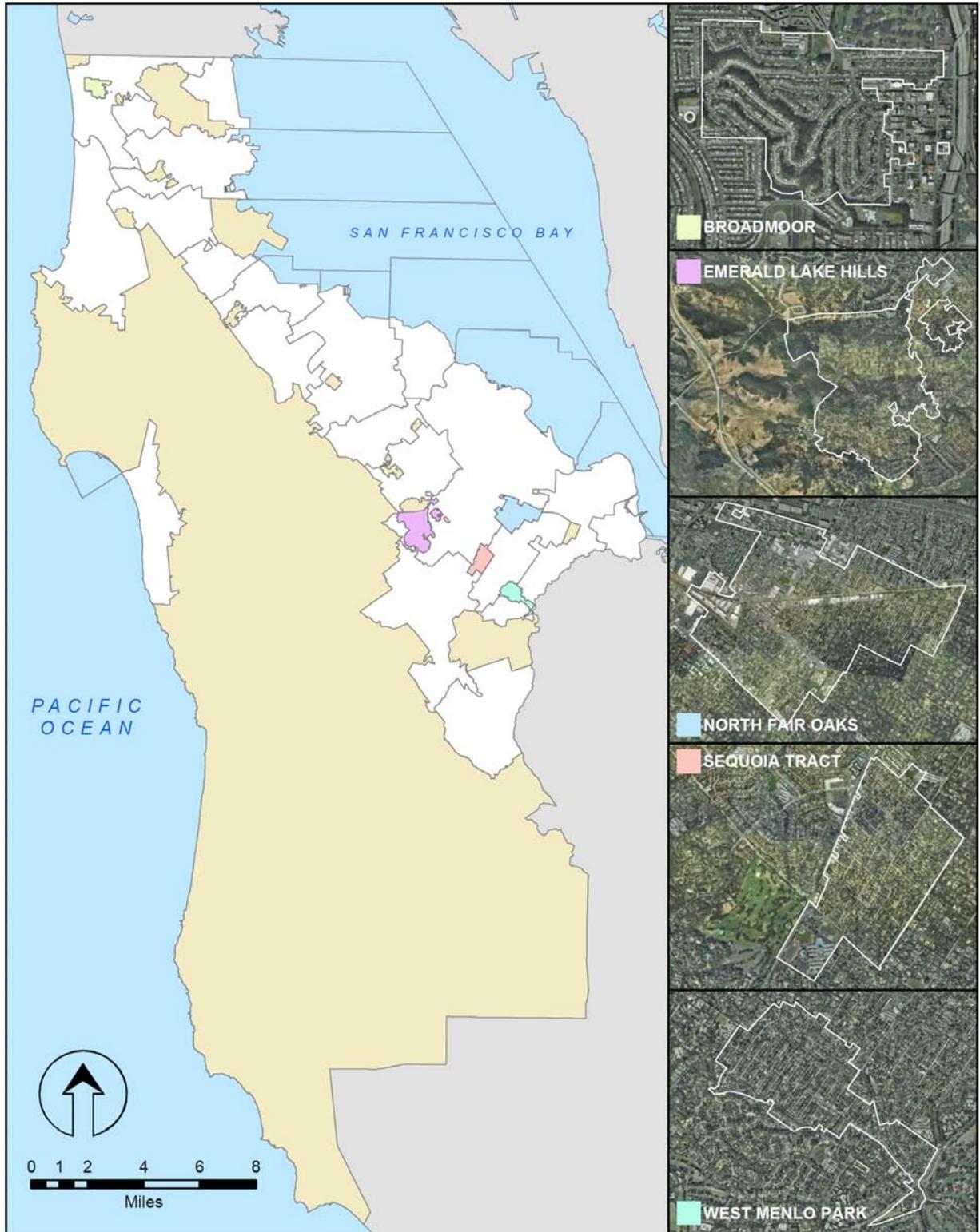
Residents use natural gas to heat water and fuel natural gas cooking ranges. Electricity powers appliances that are the cornerstones of home life, from microwaves to refrigerators. Higher levels of residential energy efficiency lead to higher levels of comfort, lower energy bills, and increased property values. Energy efficiency can be achieved through actions such as home weatherization, improved attic insulation, upgrading of windows, and upgrading of heating, ventilation, and air conditioning (HVAC) units. While there is regional variation in home heating and cooling needs from the cooler coastal communities to inland areas, the unincorporated county's older building stock represents a considerable opportunity for a menu of energy improvements.

Unincorporated Communities with Older Housing Homes and Potentially Higher Opportunities for Energy

Improvements:

- **Broadmoor.** 4% of housing stock built before 1940 and 56% built from 1940-1949, median year of home construction: 1948
- **North Fair Oaks.** 30% built before 1940, median year of home construction: 1959
- **Emerald Lake Hills.** 28% built before 1940, median year of home construction: 1967
- **West Menlo Park.** 28% built before 1940, median year of home construction: 1957
- **Sequoia Tract.** 24% built before 1940, median year of home construction: 1960

Figure 10. Mature Communities in San Mateo County



San Mateo County Planning & Building Department | Graphic Section

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Measure 1.1: Energy Upgrade California

Promote voluntary energy efficiency improvements through rebate programs, such as the Energy Upgrade California program, and other similar programs as they become available.

Action Items:

- Gather information on program effectiveness, and use information to continue tailoring marketing to specific residential customers.
- Implement and expand the Reduce Before You Produce program and the residential Energy Action Program.

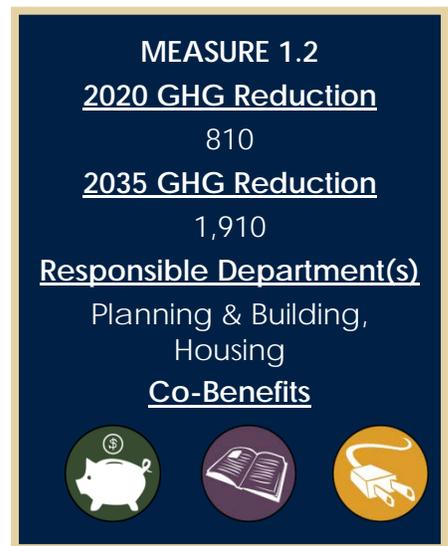
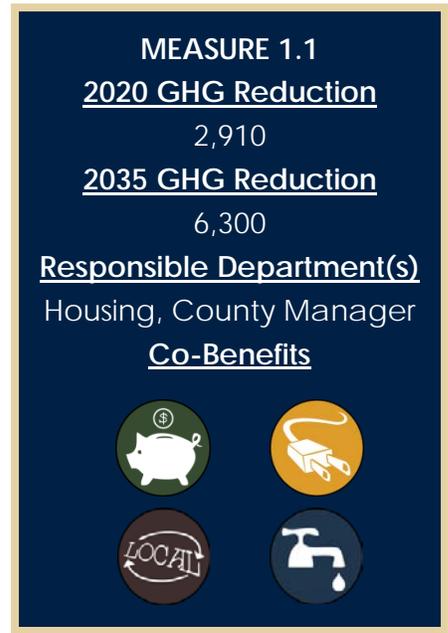
This reduction measure is designed to take full advantage of existing programs that incentivize and encourage residential energy efficiency retrofits. In this measure, the County will promote the Energy Upgrade California (EUC) program, a one-stop shop for homeowners to identify and plan upgrade projects, find qualified contractors to perform the retrofits, and find rebates and incentives to reduce or cover the cost of the upgrades. In San Mateo County (including the incorporated cities), the average energy savings achieved from EUC retrofits is 30%. Once the program ends, other programs are expected to be available to homeowners to access technical assistance and incentives for energy efficiency upgrades.

Measure 1.2: Residential Energy Efficiency Financing

Research and promote innovative financing opportunities for residential energy efficiency upgrades to achieve 30% average household energy savings.

Action Items:

- Research various options, including on-bill financing or “green mortgages,” for financing energy efficiency projects.
- Work with landlords to develop and promote green leases, and work with financial institutions to develop and promote green mortgages.
- Develop a targeted marketing campaign to residents.



Numerous innovative financing opportunities exist for residential energy efficiency upgrades; this measure includes researching and promoting the most viable opportunities. Options include on-bill financing and/or energy efficiency mortgages (EEMs). The County could also work with landlords to develop and promote green leases. Once the best options are known, the County will develop a targeted marketing campaign to residents.

Energy Efficient Mortgage Case Study

First-time homebuyers Patricia and Mynette Theard purchased their home in California. It was built in 1940 and sold for \$150,000. They got an FHA loan for 95% of the value of the property. The lender saw an opportunity for them to improve on their investment and recommended an Energy Efficient Mortgage.

A Home Energy Rating System (HERS) Rating on the home recommended \$2,300 in energy improvements, including ceiling, floor, and furnace duct insulation, plus a setback thermostat. The lender set aside an extra \$2,300 for the improvements, bringing the total loan amount from \$142,500 to \$144,800. The loan closed, the Theards moved in, and the improvements were installed. The monthly mortgage payment increased by \$17, but the Theards are saving \$45 each month through lower utility bills.

US Department of Housing and Urban Development 2012

Measure 1.3: Low-Income Weatherization

Perform outreach to eligible low-income residents to encourage participation in federally funded weatherization programs.

Action Items:

- Research target residents, such as the low-income community in North Fair Oaks.
- Develop and implement a targeted marketing campaign.

Similar to Measure 1.1, this measure takes advantage of existing programs to encourage homeowners to perform energy efficiency retrofits. Specifically, the County will perform outreach to eligible low-income residents to encourage participation in weatherization programs that will allow them to upgrade their homes and achieve energy and cost savings.

Weatherization saves an average of \$437 in annual heating and cooling costs at current prices, even if only lighting and appliances are upgraded.

\$1 investment in weatherization = **\$1.80** in reduced energy bills

California Department of Community Services and Development 2012

Measure 1.4: Tree Planting

Incentivize or encourage appropriate tree planting near buildings to reduce heat gain and loss and to sequester greenhouse gases.

Action Items:

- Review other counties' tree planting programs, and determine whether to implement an incentive program and/or an educational campaign.
- Collaborate with local environmental or community organizations to fund program costs or provide outreach.
- Identify and promote desirable tree types and locations for

MEASURE 1.3

2020 GHG Reduction

1,460

2035 GHG Reduction

1,470

Responsible Department(s)

Housing, Planning & Building, in partnership with El Concilio of San Mateo County

Co-Benefits



MEASURE 1.4

2020 GHG Reduction

450

2035 GHG Reduction

910

Responsible Department(s)

Planning & Building, Public Works, Parks

Co-Benefits



plantings to minimize impact of root systems on infrastructure.

The County already has in place regulations to require the replacement of Significant and/or Heritage trees that are removed. In most cases, replacement is required at a 1:1 ratio. However, in some areas, such as certain Design Review districts on the Bayside, tree replacement is required at a 3:1 ratio.

Trees provide multiple benefits to homeowners, business owners, and the community at large. If placed strategically, trees can help reduce heat gain and loss from buildings. This is a long-term strategy, as trees take time to mature before providing maximum benefits. Similar programs have been implemented throughout California, including the Sacramento Municipal Utility District’s free shade tree planting program and the Million Trees LA project, sponsored by the City of Los Angeles and implemented with a number of project partners. Closer to home, the City of Cupertino in Santa Clara County operates a Tree4Free program in which the city covers the cost of a new tree for interested residences and businesses. Each tree costs as little as \$20.

Measure 1.5: Propane Switch

Incentivize or encourage residents to switch from propane heaters to more energy-efficient options, such as Energy Star furnaces or electric air-source heat pumps (ASHPs).

Action Items:

- Gather information on the use of propane in the unincorporated county, and provide incentives and/or educational material regarding switching from propane heaters to alternatives.
- Update building and planning permit forms to request information on propane heating and allow staff to encourage more energy efficient alternatives.

MEASURE 1.5

2020 GHG Reduction
Supportive Measure

2035 GHG Reduction
Supportive Measure

Responsible Department(s)
Planning & Building

Co-Benefits



Propane provides heating to homes dispersed throughout rural communities in the county. Approximately 500 homes in the unincorporated county rely on propane as the primary form of home heating. Propane combustion is a more GHG-intense form of heating. The County will incentivize or encourage residents to switch from propane heaters to more energy efficient, alternatively fueled options, such as wood-pellet stoves.

GOAL 2: COMMERCIAL AND INDUSTRIAL ENERGY EFFICIENCY

Achieve optimum commercial and industrial energy efficiency.

San Mateo County is dedicated to fostering the success of local industries and businesses. The County is home to a diverse range of economic sectors, from San Francisco International Airport to educational services, service research, and professional fields. Each economic sector has a unique energy use profile, with different opportunities for energy conservation and efficiency. Strategies that support efficiencies at large biotech firms will vary from the strategies that will support the smaller family-owned operations. In 2005, three sectors consumed 80% of all energy use (see **Figure 11**). This Plan recognizes that these energy-intensive sectors provide greater opportunities for energy reductions.

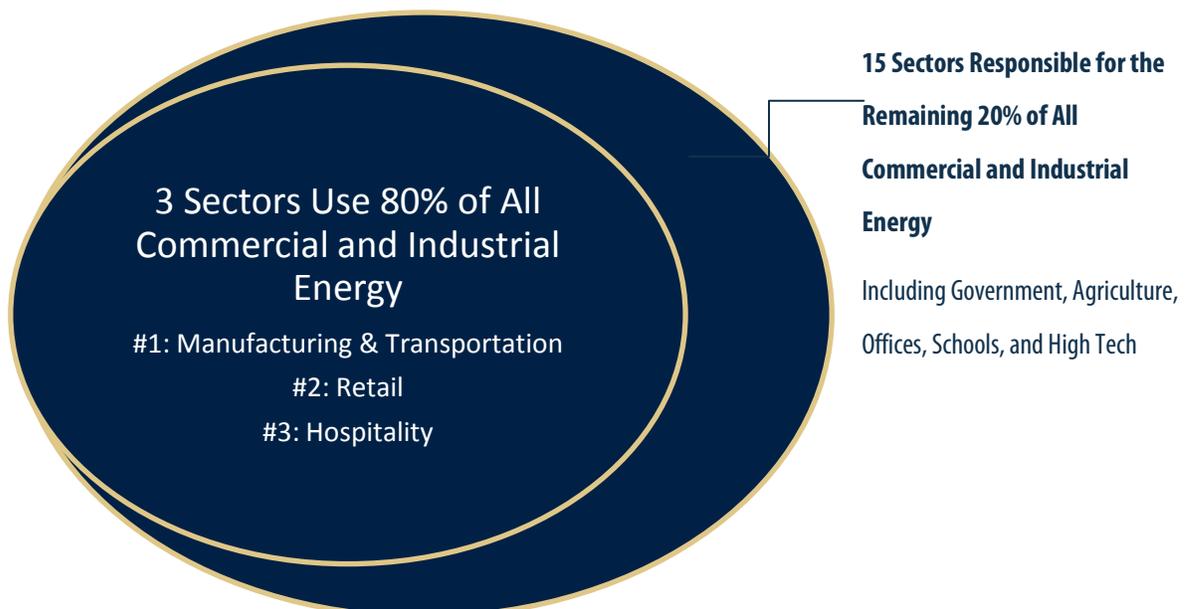
This goal identifies strategies to equip local businesses to realize significant cost and operational savings through energy conservation and efficiency improvements. By enabling local businesses to increase their efficiencies and enhance profitability, the County will strengthen its position as a Bay Area economic hub.

Top Employers in San Mateo County:

- United Airlines: 9,600 employees
- Genentech Inc.: 8,250 employees
- Oracle Corp.: 5,642 employees
- San Mateo County: 5,443 employees

(San Mateo County, 2010)

Figure 11. Commercial and Industrial Energy Use by Sector, Ranked by Contribution to Total Energy Use

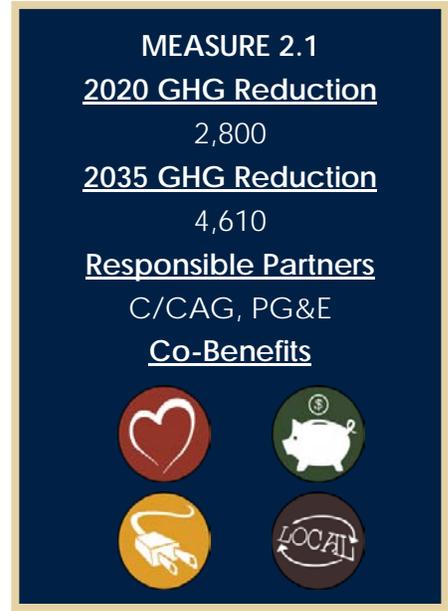


Measure 2.1: Commercial and Industrial Efficiency

Promote and potentially further incentivize third-party programs for commercial and industrial energy efficiency, such as the Commercial Industrial Boiler Efficiency Program.

Action Items:

- Gather information on program effectiveness, and use information to tailor marketing to specific groups.
- Promote third-party incentive programs, including the Commercial Industrial Boiler Efficiency Program, Air Care Plus, and LodgingSavers.
- Implement and expand various energy efficiency rebate and incentive programs, such as San Mateo County Energy Watch and the Right Lights Program.
- Identify top energy users of the commercial market to target for benefit from promotion efforts.



With a successful and highly competitive bioscience and technology base, San Mateo County is home to numerous commercial and industrial enterprises with opportunities for greater energy efficiencies. The County will partner with companies and third-party providers to identify opportunities. Through implementation of this measure, the County will potentially further incentivize third-party programs for energy efficiency, particularly for reduction of natural gas usage. Example programs include the Commercial Industrial Boiler Efficiency Program. The County will also continue to implement various energy efficiency rebate and incentive programs, such as San Mateo County Energy Watch and the Right Lights Program. In implementing this measure, the County will focus on top energy users of the commercial market, as well as on programs that reduce natural gas usage, since natural gas usage is responsible for a large portion of the GHG emissions from the commercial and industrial sector in the unincorporated county.

Measure 2.2: Commercial Financing

Research and promote innovative financing opportunities for commercial energy efficiency upgrades.

Action Items:

- Research various options, such as CaliforniaFIRST Property Assessed Clean Energy, on-bill financing, or “green mortgages,” for financing energy efficiency projects.
- Work with landlords to develop and promote green leases, and work with financial institutions to develop and promote green mortgages

Similar to Measure 1.2, the County will work to promote and encourage the use of innovative financing mechanisms for energy efficiency in the commercial sector. One option is the CaliforniaFIRST Property Assessed Clean Energy program. Other options include on-bill financing and “green mortgages” for financing energy efficiency projects. The County will also work with landlords to develop and promote green leases and work with financial institutions to develop and promote green mortgages. Many of these options, such as on-bill financing, are currently available, but may not be widely used if customers are unaware that these options exist.

Measure 2.3: Institutional Energy Efficiency

Facilitate energy efficiency in large institutional energy users, including golf courses, airports, and schools.

Action Items:

- Assess and target businesses with significant opportunities for improvements, including some of the unincorporated county’s largest energy users, such as airports, manufacturing uses, country clubs, and golf courses.
- Research and promote high-impact energy efficiency options, target key institutions, and develop partnerships to implement new projects, such as a collaborative partnership with local school districts.
- Promote opportunities for energy audits and upgrades through the County’s website and additional outreach efforts.

MEASURE 2.2
2020 GHG Reduction
 1,710
2035 GHG Reduction
 4,590
Responsible Department(s)
 Planning & Building with other departments to be determined
Co-Benefits



MEASURE 2.3
2020 GHG Reduction
 11,070
2035 GHG Reduction
 34,290
Responsible Department(s)
 Planning & Building with other departments to be determined
Co-Benefits



- Target outreach efforts to institutions with high natural gas usage specifically to promote market programs designed to reduce natural gas consumption.

The unincorporated county has numerous large institutional energy users, including San Francisco International Airport (SFO), as well as several country clubs and golf courses. The County will target and develop partnerships with these large energy users to encourage energy audits and upgrades. Similar to other reduction measures in the commercial and industrial sector, the County will identify market programs that can equip institutions with high natural gas usage to reduce natural gas consumption. Specific energy efficiency opportunities exist for country clubs and golf courses, including more efficient HVAC, boilers, water pumps, and irrigation equipment. As an example of what a very large institution can achieve, SFO has achieved over 8 million kWh of electricity reductions since 1998 (San Francisco International Airport, 2010). The County will research high-impact energy efficiency options, target key institutions, and develop partnerships to implement new projects.

For purposes of this measure, energy usage at Half Moon Bay Airport and SFO in the unincorporated County are included in this measure. This measure includes energy efficiency improvements achieved at SFO since the baseline year. Retrofits at SFO are also used to estimate additional potential savings at large institutions throughout the unincorporated county.

Measure 2.4: Green Business Program

Participate in the County Green Business Program to encourage sustainability and energy efficiency in businesses throughout the unincorporated county.

Action Items:

- Research the possibility of beginning a licensing program for businesses and the feasibility of participating in the Green Business Program, which identifies standards for energy efficiency, waste, and sustainability.
- Promote opportunities for businesses “greening” through local chambers of commerce and other partners.

MEASURE 2.4
2020 GHG Reduction
Supportive Measure
2035 GHG Reduction
Supportive Measure
Responsible Department(s)
Public Works, Planning
Co-Benefits



The County will participate in the County’s Green Business Program, which may be dependent upon the County developing a business licensing program. This will allow the County to promote sustainable practices in local businesses and help direct businesses to resources for green operations and practices. This program also provides increased opportunities for marketing and promotions.

Measure 2.5: Implement AB 1103

Support energy benchmarking of the nonresidential sector to help business owners identify opportunities for energy improvements.

Action Items:

- Perform outreach and training to building owners, managers, and landlords regarding energy benchmarking and ongoing energy management. These efforts will help businesses comply with AB 1103, which requires nonresidential buildings to benchmark energy usage and disclose energy usage information upon the sale, lease, or financing of the entire building.
- Promote energy management and monitoring tools and free training opportunities provided by entities such as PG&E through the County's website and publications.
- Provide materials to encourage business participation in energy monitoring programs through PG&E or programs such as the Energy Star Portfolio Manager (EPSM) to help businesses understand and track the impact of appliances on energy use.

The County will support the implementation of AB 1103, which requires nonresidential buildings to benchmark energy usage and disclose energy usage information upon the sale, lease, or financing of the entire building. Specifically, the County will promote energy management and monitoring tools, and will perform outreach to connect private building owners to resources and training for energy management and benchmarking.

MEASURE 2.5
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Public Works, Planning &
 Building
Co-Benefits





Since 2005, the County permitted 112 green residential projects (331,492 square feet) and 5 green commercial projects (31,946 square feet).

GOAL 3: ENERGY EFFICIENCY IN NEW CONSTRUCTION

Exceed State energy efficiency standards in new development.

San Mateo County has long been a leader in green building. In 2007, the County adopted the unincorporated county's first Green Building Ordinance (GBO). In effect since 2008, the GBO applies to all new construction projects as well as to significant remodels. Expedited building permit processing is available as an incentive to projects achieving higher points or certifications. This goal builds on the County's success in implementing minimum green standards to date.

Strategies under this goal topic target new development for both residential and nonresidential projects, although the majority of new development in the unincorporated county is residential. Data on new permits from 2008 to 2011 show that only 3% of new projects are commercial or industrial, while 56% are new single-family residences and the remaining are residential remodel projects. Energy efficiency in new development benefits property owners through increased property value and lower energy bills. Several of these benefits are identified in **Figure 12**.

Figure 12. What Are the Benefits of Green Building?



Adapted from US Green Building Council, 2012

Measure 3.1: Green Building Ordinance

Strengthen the energy efficiency requirements of the existing Green Building Ordinance, which was initially adopted in 2008, with appropriate outreach to stakeholders.

Action Items:

- Maintain alignment with current state policies, regulations, and proposed legislation.
- Train staff as needed to ensure compliance with code provisions.

MEASURE 3.1

2020 GHG Reduction

310

2035 GHG Reduction

800

Responsible Department(s)

Planning and Building

Co-Benefits







- Through the Green Building Ordinance update, work with stakeholders to expand the requirements of energy efficiency for new development to achieve compliance with CALGreen Tier 1 energy efficiency standards.

San Mateo County's Green Building Ordinance has been in effect since 2008 and applies to all new construction projects as well as to projects involving a remodel of 50% or greater of the value of the building. All new residential projects must receive at least 50 points on the appropriate GreenPoint Rated Checklist or LEED certification. Expedited building permit processing is available as an incentive to projects achieving higher points or certifications. In the commercial and industrial sector, new buildings or remodels of at least 3,000 square feet in area are required to achieve LEED certification. As with residential projects, expedited permit processing and inspections are available to projects that achieve a higher level of certification; in this case, buildings must achieve LEED Silver or above.

The County is currently updating the Green Building Ordinance. To implement this measure, by 2016 the County will update the Green Building Ordinance to require compliance with prescriptive energy efficiency reductions consistent with the California Green Building Code (CALGreen) Tier 1 voluntary standards.

Measure 3.2: Green Building Incentives

Provide additional incentives to promote voluntary green building practices.

Action Items:

- Investigate the potential to set up revolving loan funds for green building projects.
- Identify additional incentives to encourage voluntary energy efficiency in projects not subject to the Green Building Ordinance, including commercial and industrial projects smaller than 3,000 square feet.

Identify additional incentives to encourage voluntary energy efficiency in projects not subject to the Green Building Ordinance. The County will consider providing additional incentives for green building practices beyond those included in the updated Green Building Ordinance. For example, one strategy is to develop a revolving loan fund that could be used for new construction projects to implement energy-efficient features. Energy cost savings from the features would be used to pay back the loan for each project.



Measure 3.3: Urban Heat Island

Require tree planting, shading design, solar orientation, and “cool” hardscapes.

Action Items:

- Require areas with hardscape design to integrate shading, “cool” surfaces design, and open-grid paving.
- Require tree planting, shading design, solar orientation, “cool” hardscapes, and pervious and open-grid materials such as pavers, stone, blocks and interlocking concrete pavements with high-albedo reflective material to reduce heat absorption.

The County will phase in adoption of mandatory measures that will require new construction to take measures to mitigate the urban heat island effect. The urban heat island effect occurs when large paved areas and rooftops increase the surrounding temperature. One study estimates that the urban heat island effect is responsible for 5–10% of peak electricity demand for cooling buildings in cities. Strategies such as tree planting, shading design, and requiring or encouraging the use of “cool” surfaces for paving greatly reduce the effect, reducing the energy required to cool buildings. California now requires new construction complying to incorporate “cool roofs,” which is a key strategy used to combat the effect. Reducing the urban heat island effect is also an important strategy for climate adaptation, since increasing temperatures are expected to exacerbate the effect.

In the Bay Area, the City of San Jose has been aggressive in introducing policies to reduce the urban heat island effect by including landscape design for urban heat island mitigation in its 2001 Green Building Policy. The City of Sacramento has also been a leader in this area, and since 2001 has required all new parking lots to include tree plantings designed to result in 50% shading of parking lot surface areas within 15 years.

Measure 3.4: Expedited Permitting

Expedite the review, permitting, and inspection process for projects targeting higher levels of energy reduction than mandated target goals or incorporating renewable energy systems.

MEASURE 3.3

2020 GHG Reduction
 <20

2035 GHG Reduction
 20

Responsible Department(s)
 Planning and Building,
 Housing

Co-Benefits







Cities currently implementing revolving loan funds for energy efficiency include the City of Chula Vista and the City of San Francisco, in partnership with the Bay Area Multifamily fund.

MEASURE 3.4

2020 GHG Reduction
 Supportive Measure

2035 GHG Reduction
 Supportive Measure

Responsible Department(s)
 Planning & Building

Co-Benefits




Action Items:

- Identify/remove regulatory barriers in the permit and CEQA process.

The County will expedite the review, permitting, and inspection process for projects targeting higher levels of energy reduction than mandated target goals or incorporating renewable energy systems. The County will identify new incentives to streamline the review of projects through simplified administrative procedures. As part of this measure, the County will also identify and remove regulatory barriers in the permit and CEQA process, to the extent possible.

Measure 3.5: Efficiency Training & Outreach

Promote green building practices and develop community-wide capacity for energy efficiency in new construction.

Action Items:

- Provide information and education to the public and Building Department staff on best practices for green building, incentive/rebate programs available, and green building materials and techniques.
- Work with builders associations, the US Green Building Council, and other stakeholder groups to share green building resources.
- Use the County's Green Team to further promote green building.

County staff have a history of proactive efforts to promote energy efficiency and green building techniques through the County's website, publications, and events. The County Green Team has even hosted a Green Bag Lecture series, including webcast green building lunch presentations that were open to the public. This measure identifies the County's continued commitment to fill the gap for green building education and outreach. The County may utilize the model developed for the Reduce Before You Produce Program, which included creation of an energy manager program coordinator to implement community-wide energy efficiency programs and lead outreach efforts.

MEASURE 3.5
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building, Public
 Works, Public Library
Co-Benefits





The Green Town SunShares pilot program provides discounts on energy equipment to residents in San Mateo and Santa Clara counties, including up to 6% discounts on energy efficiency assessments and upgrades and solar PV program offering PV panels at a discounted rate of \$4.25/watt.

Source: BACC 2012.

Measure 3.6: Regional Energy Efficiency Efforts

Develop programs and incentives to promote large-scale community-wide partnerships for energy efficiency.

Action Items:

- Work with PG&E, local banks, nonprofits, and other local government jurisdictions to develop partnerships for implementation of a bulk purchase program.
- Create a neighborhood energy efficiency competition.

There are many energy-saving opportunities that make sense if various local municipalities in the same region work together cooperatively to develop large-scale community-wide partnerships for energy efficiency. One example could be the use of public-private partnerships and other methods to finance the bulk purchase of solar panels and the bulk purchase of more energy efficient equipment. To implement this measure, the County will work with the utility, local banks, nonprofits, and other local government jurisdictions. Another option is to develop a regional neighborhood energy savings competition; similar competitions in other regions have reduced household energy consumption by 5% to 12%.

MEASURE 3.6

2020 GHG Reduction
10

2035 GHG Reduction
10

Responsible Department(s)
Planning & Building,
Housing, Public Works

Co-Benefits







GOAL 4: RENEWABLE ENERGY

Establish San Mateo County as a leader in the use of innovative renewable energy.

The county's natural coastal areas and developed urban communities provide a diverse mix of opportunities for use of renewable energy resources. The intent of this goal is to shift a portion of energy consumption away from traditional electricity and natural gas (i.e., fossil fuels) to renewable energy sources. Both natural gas and electricity can be offset with renewable sources of energy that are profitable, yield cost savings to users, and spur local energy independence. Through this goal, the County will reduce GHG emissions from traditional electricity production and natural gas by promoting the production of local, on-site renewable energy for both residential and nonresidential uses. This goal also identifies long-range visions to encourage large-scale renewable projects that tap the county's natural wind resources. Through these measures, the County will continue to lead the region by example through its innovative use of alternative and renewable energy sources that save money.

Measure 4.1: Solar PV Incentives

Provide incentives for small-scale solar photovoltaic (PV) systems less than 10 kW in size to encourage solar PV energy installations on existing development.

Action Items:

- Research potential incentives.
- Expedite permits for small-scale solar PV systems.
- Consider creation of a revolving loan fund for small-scale solar systems.
- Update the relevant ordinances and educate stakeholders regarding the change.

Under this measure, the County will provide incentives for solar PV installations and remove or reduce permit fees for the installations. Specifically, the County will research potential incentives that the County can provide through code updates, such as expedited permit processing. The County may also consider creation of a revolving loan fund for solar photovoltaic systems in conjunction with other measures in this Plan. These strategies will allow the County to continue supporting local renewable energy projects beyond the life of the California Solar Initiative (CSI) program. An additional action in this measure equips the County to achieve new PV beyond what is incentivized in the CSI program, which is included in the adjusted business-as-usual (BAU) forecast of emissions for San Mateo County.

As of 2010, residents in unincorporated San Mateo County installed 69 residential solar photovoltaic (PV) systems through the California Solar Initiative Program. These installations generated approximately 475,500 annual kWh, reducing the equivalent of the electricity consumed by approximately 66 homes in the county.

MEASURE 4.1

2020 GHG Reduction
100

2035 GHG Reduction
410

Responsible Department(s)
Planning & Building, Public Works, Tax Collector/Treasurer/ Revenue Services

Co-Benefits






Measure 4.2: Solar Water Heater Incentives

Provide incentives for solar water heaters and reduce/remove permit fees for solar hot water energy installations.

Action Items:

- Research potential incentives.
- Consider expedited permits, as well as a revolving loan fund.
- Update the relevant ordinances and educate stakeholders regarding the change.

MEASURE 4.2

2020 GHG Reduction
100

2035 GHG Reduction
470

Responsible Department(s)
Planning & Building,
Housing

Co-Benefits




Solar water heaters are cost-effective renewable energy options that reduce the need for natural gas or electricity to power a conventional water heater. Similar to Measure 4.1, this measure will provide incentives for solar water heater installations and remove or reduce permit fees for the installations. This measure includes new PV beyond what is incentivized in the CSI program.

Measure 4.3: Pre-Wired Solar Homes

Require all new roofs to be pre-wired for solar PV and all new buildings to be plumbed for solar water heaters.

Action Items:

- Adopt a requirement for pre-wired solar through the Green Building Code update, which is a CALGreen voluntary elective measure (A5.211.4) for both Tier 1 and Tier 2.

By requiring pre-wiring for solar PV and water heaters in new buildings, the County will support the bundling of initial costs into overall project financing. Incorporating these costs upfront minimizes the subsequent financing burden of solar improvements, which would require separate financial resources or financing if paid for at a later time. Integrating pre-wiring will ensure that new buildings support solar PV and hot water systems, and encourage installation of solar facilities. This measure also supports compliance with CALGreen Tier 1 standards.

MEASURE 4.3

2020 GHG Reduction
Supportive Measure

2035 GHG Reduction
Supportive Measure

Responsible Department(s)
Planning & Building,
Housing

Co-Benefits



Measure 4.4: Pilot Solar Program

Encourage developers to offer solar PV and solar water heaters as a standard feature on a percentage of new homes in a development and as an upgrade for redevelopment projects in residential and commercial projects.

Action Items:

- Encourage pilot program consideration, and provide an expedited permit process and reduced fees for developers.
- After the pilot, conduct an evaluation using real estate agents/owners to see if solar features were a primary purchasing factor for buyers and whether to continue the program as standard in the unincorporated county.

The County will develop the Pilot Solar Program and encourage developers to offer solar PV and solar water heaters as a standard feature on a percentage of new homes in a development and as an upgrade for redevelopment projects in residential and commercial projects. Specifically, the County will encourage development of the pilot program, provide an expedited permit process, and reduce fees for developers. After the pilot, the County will conduct an evaluation using real estate agents and home or building owners to see if solar features were a primary purchasing factor for buyers and whether to continue the program as standard in the unincorporated county.

MEASURE 4.4

2020 GHG Reduction
70

2035 GHG Reduction
530

Responsible Department(s)
Planning & Building,
Housing, in partnership
with Joint Venture Silicon
Valley

Co-Benefits






Case Study: Sutter Pointe solar program

A new development in Sutter County will provide solar as a standard feature on a percentage of all new homes and as an upgrade option for all homes.

Source: Sutter County, 2010

Measure 4.5: Renewable Financing

Encourage the adoption of new, innovative financing options for renewable installations.

Action Items:

- Work with the local real estate community and other partners to encourage appropriate options, such as power purchase agreements (PPA), “solar leases,” or a Property Assessed Clean Energy (PACE) program.
- Continue to promote financing options through existing County programs.

This measure encourages the adoption of new, innovative financing options for renewable energy installations; some of the options may include power purchase agreements, solar leasing, or Property Assessed Clean Energy (PACE) programs. PACE programs are voluntary initiatives that allow property owners to finance energy efficiency and renewable energy projects for their homes and commercial buildings. The improvements or renewable energy installations are repaid through an assessment on property taxes for up to 20 years, and if the building is sold, the repayment obligation automatically transfers to the new owner.

One of the first jurisdictions in the state with a PACE program is Sonoma County. Over the three years of the program’s existence, 3,179 households and 87 businesses have participated in the program, which is equal to approximately 1.7% of households and 0.2% of businesses in Sonoma County (Sonoma County, 2012). This measure assumes that, in San Mateo County, 15% of households and 3% of businesses will participate by 2020 and 55% of households and 11% of businesses will participate by 2035. These are aggressive participation rates that will depend on countywide marketing and regional partnerships to promote the program.

MEASURE 4.5

2020 GHG Reduction
3,100

2035 GHG Reduction
10,810

Responsible Department(s)
Tax Collector/Treasurer/
Revenue Services,
Planning and Building

Co-Benefits







Measure 4.6: Commercial Wind Power

Encourage the development of commercial wind farms.

Action Items:

- Research and identify the areas with the highest feasibility for commercial wind power, including locations near existing power facilities and existing transmission lines.
- Work with utility providers and renewable energy interest groups to attract interested commercial wind power businesses.
- Encourage commercial wind farms only in locations that minimize impacts to wildlife and are determined to be bird-safe.

The unincorporated county has adequate wind resources for energy generation on both the coastal and bay side of the county, although wind resources are more favorable on the coastal side. Under this measure, the County will research and identify the areas with the most potential wind energy resources and identify and develop methods to address barriers to wind energy development, including permitting issues and areas of appropriate location.

Measure 4.7: Incentivize Wind Energy

Incentivize safe and effective small distributed generation wind power systems on existing development in locations that complement existing land uses.

Action Items:

- Identify and develop methods to address barriers to wind energy development, including permitting issues and potential opposition from the local community.
- Create expedited permit processing for distributed generation wind power systems.
- Update development standards to allow distributed generation wind power systems by right in appropriate land use designations, where impacts on birds and wildlife can be mitigated.

MEASURE 4.6

2020 GHG Reduction

Supportive Measure

2035 GHG Reduction

Supportive Measure

Responsible Department(s)

Planning & Building

Co-Benefits



MEASURE 4.7

2020 GHG Reduction

430

2035 GHG Reduction

680

Responsible Department(s)

Planning & Building,

Co-Benefits



This measure works to encourage small-scale, distributed generation wind power systems in existing development, including infill locations like parking lots, manufacturing or commercial uses, or small-scale residential use. The State of California currently offers a rebate to any property owner that purchases a renewable energy wind turbine; the rebate amount is \$500 per watt, up to a maximum of \$4,000 for 8 watts. This measure assumes that residents in unincorporated areas near the coast provide greater opportunities to implement this measure.

Measure 4.8: Investigate Community Choice Aggregation

Investigate Community Choice Aggregation (CCA) to allow residents and businesses in the unincorporated county to aggregate their buying power to purchase renewable energy.

Action Items:

- Conduct a feasibility study to determine costs, benefits, and other issues. Review results with relevant stakeholders. If appropriate for the County, move forward with a detailed implementation plan.

The County will investigate Community Choice Aggregation (CCA), which would allow residents and businesses in the unincorporated county to aggregate their buying power to purchase alternative energy supply contracts from providers other than PG&E. CCAs are defined by AB 117, which permits any city, county, or city and county working together to aggregate electric loads to facilitate the direct purchase and sale of electrical energy. Several communities have investigated the feasibility of developing a CCA program, although only one currently exists in California (the Marin Energy Authority), and San Francisco is in the process of finalizing its consideration but has not yet implemented its program.

MEASURE 4.8

2020 GHG Reduction
Supportive Measure

2035 GHG Reduction
Supportive Measure

Responsible Department(s)
Public Works, Housing

Co-Benefits




Measure 4.9: Emissions Offset Programs

Allow new development projects to participate in CO₂ offset programs, such as to purchase electricity generated from renewable sources off-site.

Action Items:

- Provide educational materials to developers and other project partners regarding purchasing options for offsets, focusing on sources of real, additional, and independently verifiable offsets

MEASURE 4.9

2020 GHG Reduction
2,630

2035 GHG Reduction
22,380

Responsible Department(s)
Planning and Building,
Public Works

Co-Benefits




under rigorous certification protocols, such as those of the Climate Action Registry.

- Develop conditions of approval for development projects that allow a project to at least partially mitigate the project's GHG impacts, that cannot reasonably be reduced on-site, through offsets that are real, additional, and independently verified under rigorous certification protocols, such as those of the Climate Action Registry.

For example, new development projects can purchase renewable energy credits to claim the environmental benefits from electricity generated from off-site renewable sources. Under this measure, the County can support these programs by providing educational materials regarding offset purchasing options to developers and other project partners. This measure complements Measure 3.1, the County's Green Building Ordinance, because all new commercial projects in the unincorporated county of 3,000 square feet or greater are currently required to obtain LEED certification, and purchasing offsets can be used to increase the number of points awarded under the LEED rating system for building design and construction.

Measure 4.10: Waste to Energy

Incentivize or encourage the use of green waste and food waste for alternative energy generation.

Action Items:

- Gather information on the current use of agricultural waste and food waste in the unincorporated county, and provide incentives and/or educational material regarding digesters and other technologies. External financial incentives may be available.

According to data from the California Department of Resources Recycling and Recovery (CalRecycle), a large amount of organic waste from the unincorporated county is currently sent to landfills. Currently, UC Davis is sponsoring a pilot project for this purpose, in which an anaerobic digester is being used to treat 3–8 tons of food waste per day from restaurants to generate biogas. To achieve the targets of this measure, the County will facilitate the diversion of 4,000 tons of organic waste per year to waste-to-energy systems by 2020.

GOAL 5: DESIGN FOR MOBILITY & CONNECTIVITY

Integrate mobility and connectivity by design into new development to reduce per capita vehicle miles traveled.

This goal builds on the County's efforts to create vibrant, mixed-use communities throughout the unincorporated county in appropriate areas to better meet the needs of residents. Through the adoption of

MEASURE 4.10
2020 GHG Reduction
 50
2035 GHG Reduction
 140
Responsible Department(s)
 Public Works
Co-Benefits






the Colma BART station neighborhood plan (1993) and the North Fair Oaks Community Plan (2011), the County has encouraged transit-oriented and mixed-use development by right. Standards support easy access to public transit and infrastructure that supports walking and bicycling activity. The plans for these communities promote the co-location of homes to schools, works, and shops while protecting the unique characteristics of the county's more established neighborhoods and rural areas. Policies and actions for mobility and connectivity in new development build on these strategies, developed to respect the unique challenges and opportunities of the county's unincorporated communities.

Measure 5.1: General Plan and Zoning Updates

Update the General Plan and Zoning Ordinance to encourage transit-oriented, mixed-use developments at appropriate locations.

Action Items:

- Where feasible, new projects should have a mix of the following on site or off site within a quarter of a mile: residential, office, retail, park, or open space.
- Where feasible for new development, the project should be designed to encourage walking, bicycling, and utilization of public transportation to and from jobs, shopping, recreation, and other uses.
- Where feasible, new projects should be centrally located near existing transit corridors where public transportation is easily accessible.

MEASURE 5.1

2020 GHG Reduction
420

2035 GHG Reduction
380

Responsible Department(s)
Planning & Building

Co-Benefits



While prioritizing the protection of natural resources, the County is moving forward to target appropriate areas for an intensification of efficient, transit-oriented development. This measure includes the County's use of zoning standards to implement policies of existing area plans, in addition to extension of policies for these area plans into other communities. For example, the County already has in place an Area Plan and zoning for the unincorporated Colma area that encourages high-density transit-oriented mixed-use development near the Colma BART station. A number of projects have already been constructed in accordance with this Plan, and the County anticipates further similar development in this area. In addition, in 2011 the County adopted the North Fair Oaks Community Plan, which will also encourage mixed-use, multi-modal development along the Middlefield Road and El Camino Real Corridors. Zoning for North Fair Oaks to implement this Plan is currently being developed.

The implementation of this measure will position the County for implementation of SB 375 through the alignment of housing and transportation options that reduce the need to drive, and in turn, reduce emissions from the transportation sector. The County will be acting as an early leader and position itself to serve as a regional example of the types of strategies that will be feasible and effective to implement through SB 375.

Measure 5.2: Impact Fees

Create an impact fee program for new projects to encourage development in locations with high accessibility to destinations such as jobs, retail, and other attractions. The impact fee program will also be used to fund public transit improvements or school bus programs (as discussed in Measures 6.3 and 6.4).

Action Items:

- Work with partners to create an effective impact fee program.
- Identify the most feasible and cost effective opportunities to fund with the impact fee program, including bus amenity improvements and transit maintenance.

The County will implement a program that requires development to implement mixed-use and transit-oriented standards in order to reduce reliance on cars. The County will create a list of specified mixed-use criteria, and projects not complying with these characteristics will be required to pay into an impact fee program. The County will use revenue from this program to fund or incentivize improvements that encourage mixed use or transit use, such as bicycle lockers, amenities for public transit stops, and more.

Measure 5.3: Pedestrian Design

As appropriate, require new projects in North Fair Oaks, urban communities, and business districts to include improved design elements to enhance walkability and connectivity while balancing impacts on vehicle congestion.

Action Items:

- Pedestrian-friendly design may be evaluated in terms of building setbacks, reduced street widths, small block size, proportions of four-way intersections, sidewalk coverage with adequate sidewalk width, number of pedestrian crossings, presence of street trees, and other physical variables that enhance pedestrian-oriented environments.
- New projects will provide pedestrian access to uses within the project site and will also link to destinations near the project site. Barriers to pedestrian access and interconnectivity will be mitigated.

MEASURE 5.2
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building
Co-Benefits



MEASURE 5.3
2020 GHG Reduction
 250
2035 GHG Reduction
 230
Responsible Department(s)
 Planning & Building, Public Works
Co-Benefits



The North Fair Oaks Community Plan models the County's commitment to expand and enhance the pedestrian and bicycle network. This Plan identifies new locations for signalized pedestrian crossings, key neighborhood connections, and proposed locations for pedestrian bulb-outs, striped crosswalks, and ADA-compliant interchanges. The County has begun to identify additional pockets of underutilized corridors that can potentially serve as vibrant community centers and benefit from similar strategies. To implement this measure, the County will also rely on the policies and framework of the draft San Mateo County Comprehensive Bicycle and Pedestrian Plan (CBPP) (C/CAG, 2011). This countywide document plans for creation for an integrated network of bicycle and pedestrian routes throughout the unincorporated and incorporated communities. The CBPP also identifies several pedestrian focus areas in the unincorporated county, along with design guidelines.

“San Mateo County is a leader in creating livable and environmentally sustainable communities that link housing, transportation, open space, and community services. By incorporating smart growth policies, residents are able to live in desirable neighborhoods that maximize the benefits of urban living and open space.”

Supervisor Mark Church (San Mateo County, 2009)

GOAL 6: NON-MOTORIZED AND ALTERNATIVE TRAVEL

Provide opportunities for non-motorized travel at the neighborhood scale.

Transportation is the largest contributor of GHGs within the county and one of the most complex sectors to address. Economic considerations, neighborhood boundaries, and other factors can complicate actions to optimize land use and transportation options.

The goal to facilitate non-motorized travel aims to improve community mobility in new and existing development through integrated land use and transportation planning. Strategies to reduce emissions from transportation require a multifaceted approach that includes an improved mixture of land uses, improved connectivity and circulation in existing neighborhoods, parking reduction strategies, provision of affordable housing, and an improved jobs/housing balance.

San Mateo County maintains a total of 45 miles of Class II bicycle lanes.

The County also maintains additional recreational bicycle trails:

- Total existing mileage of bicycle recreation trails: 27 miles
- Additional mileage of planned bicycle recreation trails, pending construction: 5 miles

Measure 6.1: Neighborhood Retail

When updating the General Plan, look for opportunities to add neighborhood-serving retail at key locations throughout the unincorporated county.

Action Items:

- Through the General Plan update, identify strategies to encourage co-location of neighborhood-serving uses.
- Through existing economic development strategies, actively recruit and engage potential businesses and vendors that could provide essential services to isolated communities.

Strategic growth strategies will help the County direct new, neighborhood-serving uses into existing communities. This directive approach provides more complete services to meet local needs, reducing reliance on auto trips.

Measure 6.2: Traffic Calming in New Construction and Complete Streets

Require larger new projects (including existing projects with major renovations) to evaluate and implement appropriate traffic calming measures at the site, as determined through the plan review process.

Action Items:

- Larger new projects will complete a study to identify appropriate traffic calming features, including, but not limited to, marked crosswalks, countdown signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, and chicanes/chokers.
- Larger new projects will complete a study to identify appropriate traffic calming features, including, but not limited to, marked crosswalks, countdown signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, and chicanes/chokers.
- Require larger new projects to provide short-term and long-term bicycle parking facilities.

MEASURE 6.1
2020 GHG Reduction
 990
2035 GHG Reduction
 900
Responsible Department(s)
 Planning & Building
Co-Benefits



MEASURE 6.2
2020 GHG Reduction
 180
2035 GHG Reduction
 150
Responsible Department(s)
 Planning & Building, Public
 Works in partnership with
 C/CAG
Co-Benefits



- As appropriate, use the County right-of-way to provide pedestrian infrastructure.
- Support implementation of the C/CAG Bicycle and Pedestrian Master Plan, including implementation of Class I and Class II bicycle lanes.
- In coordination with C/CAG, adopt a local Complete Streets Ordinance for the unincorporated county consistent with the One Bay Area Grant Program requirements.

The goal of traffic calming is to reorient projects for a focus on the needs of cyclists and pedestrians. This approach is also referred to as a “Complete Streets” approach to transportation, a term used to describe an integrated, multimodal transportation system that equally supports all types of transportation, including pedestrian, bicycle, and vehicular traffic. The County will also be adopting a Complete Streets ordinance that reflects the nine required elements identified by the One Bay Area Grant Program, which include an integration of a complete streets approach into the projects of all departments working on roadways, application of the approach in all roadway projects and efforts in the unincorporated county, and working towards street and network connectivity.

Measure 6.3: Traffic Impact Fund

Use the impact fee program discussed in Measure 5.2 to fund transit improvements, optimization, and expansion in the county.

Action Items:

- Require the adoption of the transit expansion program in the new impact fee program update.

The County will fund infrastructure and amenities that provide greater comfort and ease of access to transit passengers that will support higher levels of ridership. In order to support SamTrans, the County will use revenue from impact funds to provide the necessary infrastructure and connections to the regional transit network, such as shuttle services or bus shelters.

MEASURE 6.3
2020 GHG Reduction
Supportive Measure
2035 GHG Reduction
Supportive Measure
Responsible Department(s)
Planning & Building, Public Works
Co-Benefits



Measure 6.4: Expand Transit

Work with SamTrans to optimize the local transit network by adding or modifying existing transit service to enhance service near future project sites and areas of future demand in the unincorporated county.

Action Items:

- Encourage SamTrans to reduce transit-passenger travel time through more reduced headways and increased speed and reliability.
- Support improved access to transit facilities through sidewalk/crosswalk safety and bus shelter enhancements. These improvements make transit service more attractive and may result in a mode shift from auto to transit that reduces vehicle miles traveled (VMT).

Trips associated with commuting will be reduced through a multipronged approach to funding and supporting optimal levels of transit ridership. The County will work closely with SamTrans to support regional transportation planning efforts and ensure effective coordination of resources.

MEASURE 6.4

2020 GHG Reduction
350

2035 GHG Reduction
300

Responsible Department(s)
Planning & Building in partnership with SamTrans

Co-Benefits







GOAL 7: EFFICIENT PARKING

Develop efficient parking practices.

An overabundance of parking at commercial uses encourages continued reliance on auto travel. Through more efficient and appropriate levels of parking, the County can help to optimize travel habits. This approach helps to better balance the demands of all travel modes, including public transit and auto travel.

Measure 7.1: Parking Ordinance

Amend the Zoning Ordinance to allow a reduction in parking requirements if deemed appropriate and establish parking maximums, standards that will limit the number of parking spots in new projects and allow for flexible parking reductions to discourage an over-reliance on auto travel.

Action Items:

- Adopt standards that allow for multiple uses with staggered parking demand.

MEASURE 7.1

2020 GHG Reduction
1,170

2035 GHG Reduction
1,050

Responsible Department(s)
Planning & Building

Co-Benefits




- Support provision of parking based on actual demand versus land use when lower than as required in code, if supported by findings from a parking study (for example, the North Fair Oaks parking study).
- Further allow for reductions in parking demand when employers provide a Transportation Demand Management (TDM) program, uses are located within close proximity to bus stop/transit, or for mixed-use projects.
- Work with appropriate entities including the North Fair Oaks Community Council to evaluate and identify appropriate pilot strategies for effective parking requirements that encourage alternative modes of travel.

Parking requirements will be changed to encourage and facilitate strategic growth development and alternative transportation choices by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking for nonconflicting uses. The community will test appropriate parking techniques in the Colma BART station and North Fair Oaks communities, piloting strategies that can be deployed throughout the greater unincorporated county.

Measure 7.2: Efficient Parking Design

Evaluate the existing parking standards and look for ways to increase efficiency.

Action Items:

- Examine standards in the Colma PC district and standards in other similar jurisdictions for use as replicable models.
- Support options to maintain pedestrian infrastructure while meeting adequate parking demands through efficient underground parking, structures, or other alternatives, as feasible.

Zoning and development standards can often lead to an overabundance of parking. The County will assess potential strategies to identify options for provision of optimal levels of parking for nonresidential and mixed-use projects that do not unduly encourage auto travel.

MEASURE 7.2
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Public Works, Planning &
 Building
Co-Benefits







Measure 7.3: Unbundled Parking

Work with stakeholders to unbundle parking costs from property costs at strategic locations in the county, including North Fair Oaks, the Middlefield Road area, the small business district in West Menlo Park, and areas in Emerald Lake Hills. Unbundling separates parking from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost to the property cost. This removes the burden from those who do not wish to utilize a parking space.

Action Items:

- Parking will be priced separately from home rents/purchase prices or office leases. An assumption is made that the parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces.
- Partner with the North Fair Oaks Community Council to identify, test, and implement appropriate pilot parking projects at select sites in North Fair Oaks, including strategies such as parking pricing and metered parking.

Parking requirements will be changed to encourage and facilitate strategic growth development and alternative transportation choices by eliminating or reducing minimum parking requirements, creating maximum parking requirements, and providing shared parking for nonconflicting uses.

GOAL 8: COMMUTE TRIPS

Discourage single-occupant vehicle travel to and from work.

San Mateo County spans over 400 square miles of land and nearly 300 square miles of water (San Mateo County, 2010). Residents living throughout the unincorporated county typically need to travel by car to move between home and work. In 2010, 31% of employed residents in San Mateo County drove alone over 30 minutes to work. This trend reflects the dispersed nature of land uses throughout the unincorporated county.

MEASURE 7.3

2020 GHG Reduction
2,320

2035 GHG Reduction
2,100

Responsible Department(s)
Public Works, Planning &
Building

Co-Benefits




Measure 8.1: Employee Commute

Require all large employers to implement a Commute Trip Reduction (CTR) program to discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as walking, biking, transit riding, carpooling, vanpooling, and ridesharing.

Action Items:

- Adopt annual reporting and monitoring requirements. Employers will be required to demonstrate implementation of the CTR program and report the resulting commute mode shares.
- Coordinate efforts with the Peninsula Traffic Congestion Relief Alliance (commute.org).

The County will require large employers to create a CTR. Due to the high proportion of commuters traveling between the unincorporated county and other destinations for work, this action will reduce barriers to accessing commuter resources and public transit.

Measure 8.2: Workplace Parking

Implement workplace parking pricing at employment centers.

Action Items:

- This measure may include requiring businesses to charge employees for parking, implementing above-market-rate pricing, validating parking only for invited guests, not providing employee parking, and educating employees about available alternatives.
- Work with employers to refine parking strategies to achieve efficient and optimal commute levels.

Parking pricing further incentivizes the use of alternative transit programs, reducing perceived cost of public transit and commuter programs. Due to the pattern of employee commute trips both

MEASURE 8.1
2020 GHG Reduction
 1,240
2035 GHG Reduction
 1,130
Responsible Department(s)
 Planning & Building,
 partnering with C/CAG
Co-Benefits



The Bay Area Air Quality Management District (BAAQMD) administers the Bay Area PEV Ready website. This website provides information on rebates, resources, and electric vehicle infrastructure. The BAAQMD provides rebates for qualifying residents and supports regional planning for electric vehicle charging stations.

For more information, visit the website:
<http://www.bayareapevready.org/>

MEASURE 8.2
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building in
 partnership with C/CAG
Co-Benefits



entering and leaving the county, this is an important tactic to address transportation patterns. By limiting the availability of parking in employment centers, the County incentivizes alternative transit programs for all commuters coming into the San Mateo County, regardless of their point of origin.

Measure 8.3: Employer Transit Subsidies

Require employers to provide a subsidized/discounted daily or monthly public transit pass to employees.

Action Items:

- Seek to identify partnership opportunities to fund transit subsidies that minimize impacts to businesses.
- Work in partnership with SamTrans, school districts, or private developments to identify funding. Many entities use revenue from parking to offset the cost of such a project.

Through the Commute Trip Reduction program discussed in Measure 8.1, the County will require employers to offset the costs of public transit. This strategy provides further incentives to reduce single-occupant vehicle trips.

Measure 8.4: Work Shuttles

Promote expansions of worker shuttle programs.

Action Items:

- Participate in the Shuttle Business Practices Task Force.
- Engage employers to identify appropriate strategies for shuttle participation and funding.
- Facilitate the coordination of smaller employers with the Peninsula Traffic Congestion Relief Alliance to pull together resources to establish a feasible program.

The County will work with the Shuttle Business Practices Task Force to establish or expand worker shuttle programs.

MEASURE 8.3

2020 GHG Reduction

Supportive Measure

2035 GHG Reduction

Supportive Measure

Responsible Department(s)

Planning & Building,
partnering with C/CAG

Co-Benefits



MEASURE 8.4

2020 GHG Reduction

160

2035 GHG Reduction

140

Responsible Department(s)

Planning & Building, Public
Works partnering with
C/CAG

Co-Benefits



Public and private partnership will be necessary to achieve effective work commute programs that meet the needs of employees and residents in San Mateo County. To ensure the ability of both large and small employers to implement Commute Trip Reduction programs, the County will support partnership efforts and connect smaller businesses to the resources of the Shuttle Business Practices Task Force.

GOAL 9: SCHOOL-RELATED TRAVEL

Work with schools in the county to reduce vehicle miles traveled.

According to the US Census (2010), approximately 18% of the population in San Mateo County is of school age, between the ages of 5 and 19. There are over 24 school districts throughout San Mateo County, supported by the San Mateo County Office of Education. Car trips to and from schools not only contribute to the unincorporated county's GHG emissions, but they also require extra time and costs for auto fuel use. Strategies to promote alternative means of transportation for the county's school-age population will help to reduce vehicle miles traveled (VMT) for school trips and save time and money for families in the unincorporated county.

Currently, approximately 26% of SamTrans riders are under the age of 18. SamTrans serves over 26 elementary schools, 20 middle schools, 20 high schools, and 6 colleges throughout San Mateo County. Strategies in this goal build on the existing public transit framework. Additional opportunities are outlined below to work with school districts for creative alternatives to auto transit.

Measure 9.1: Alternative School Transit

Promote school shuttle programs to reduce vehicle miles traveled (VMT).

Action Items:

- Work with local schools to restore/expand local school bus service, create a school pool ridesharing program, or start a walking school bus.
- Implement other supportive programs for school travel, such as Safe Routes to School programs for schoolchildren.

Numerous creative options exist for supportive alternative school commutes. For schools located within walking distance of neighborhoods, parents and families can volunteer to create “walking buses” or “walk pools” to school. Parents would volunteer to meet students at select locations and chaperone them to school on a pre-established route. This approach supports a higher level of safety and supervision, overcoming some of the hurdles to children walking to school. The County will also coordinate with Safe

MEASURE 9.1

2020 GHG Reduction

20

2035 GHG Reduction

20

Responsible Department(s)

Health, Public Works, in partnership with San Mateo County Office of Education

Co-Benefits




Routes to School or similar parent and school administration groups to ensure that routes are clear of obstacles and safe for walking. This measure will require ongoing partnership between school districts and these groups.

GOAL 10: ALTERNATIVE FUELS

Establish San Mateo County as a regional center for alternative fuel use and infrastructure.

While more efficient land use planning and increased circulation and transportation options will reduce vehicle trips in the unincorporated county, they cannot eliminate all vehicle trips. GHG emissions reductions will also rely on increases in vehicle fuel efficiency and expansion of alternative fuel uses by providing the necessary infrastructure to support alternative fuel and zero-emissions vehicles.

Although the state and federal governments hold the primary responsibility to increase fuel efficiency standards of new vehicles and support the development of cost-competitive alternative fuels, the County of San Mateo and the community can take several actions to further support and spur the use of more efficient vehicles.

Measure 10.1: Low Carbon Fuel Infrastructure

Increase alternative fuel infrastructure in the community.

Action Items:

- Incentivize the installation of electric vehicle (EV) charging stations in public areas and in more urban neighborhoods; and where there are five parking spaces or more in a project, require at least one charging station be installed as well as the installation of an electrical conduit within hardscape to allow additional spots to be easily added later.
- Establish neighborhood electric vehicle (NEV) networks by identifying streets and locations appropriate for NEV use in the Transportation Element of the County's General Plan.
- Seek grant funding through the state and regional partnerships to fund fleet conversions to alternative and low-emissions fuels.

MEASURE 10.1

2020 GHG Reduction
1,780

2035 GHG Reduction
2,200

Responsible Department(s)
Planning & Building, Public Works

Co-Benefits






The expanded use and purchase of alternative fuel vehicles within San Mateo County will rely heavily on the availability of these fuels. By creating a network of alternative fuel and electric vehicle charging stations and by promoting the available incentives to purchase alternative fuel vehicles, the County will ensure there is a market demand for these vehicles that produce little or no direct GHG emissions.

Measure 10.2: Alternative Fuel Outreach

Educate the public on the feasibility, availability, and incentives for alternatively fueled vehicles.

Action Items:

- Work with the BAAQMD, the Sierra Club, and other community partners to promote electric vehicle incentives and opportunities.
- Provide resources for electric vehicles on the County's website and Green Portal.

To implement this measure, the County will work actively with community groups and regional entities to promote the use of alternatively fueled vehicles. Through these partnerships, the County can build on existing momentum throughout the Bay Area for cleaner-fuel vehicles. Potential partners include the Golden Gate Electric Vehicle Association, the Sierra Club, and the Bay Area Air Quality Management District.

MEASURE 10.2
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building, Public Library
Co-Benefits

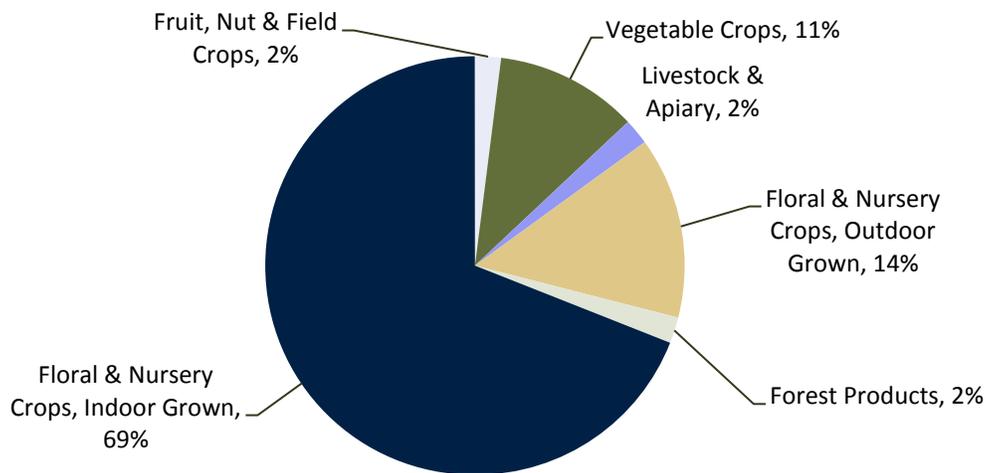



GOAL 11: LOW-EMISSIONS AGRICULTURAL PRACTICES

Promote low-emissions agricultural practices.

Agriculture is an important GHG emissions source to be considered and quantified at the local, state, and federal levels. Nationwide, agricultural activities were the single largest source of all nitrous oxide (N₂O) emissions, contributing almost 68% of all N₂O. Further, agriculture contributes approximately 35% of all methane (CH₄) emissions nationwide (US Environmental Protection Agency 2011). The County recognizes that agriculture is one of its most important resources and critical economic drivers. Integrating agriculture into San Mateo County's inventory and GHG reduction strategies allows the County and local agriculturalists to retain a higher degree of local control (where appropriate). Inventorying local GHG emissions from agriculture sources follows the best available protocol with the recognition that methodologies and assumptions will change and improve over time. The existing GHG inventory is a valuable foundation, setting the stage for engagement and an ongoing dialogue about the best methods to identify, measure, and reduce local GHG emissions.

A diversity of rural and agricultural practices exists throughout the unincorporated county. Large agricultural production enterprises supply jobs, manage resources, and create economic revenue. San Mateo County's temperate and moist climate provides an ideal growing ground for numerous crops. Indoor and outdoor nursery crops contributed over 70% of total agricultural production value in 2010 (see **Figure 13**). The unincorporated county also has twenty operating certified farmers markets that provide consumers direct access to produce grown locally. According to San Mateo County, in 2007 county producers sold nearly \$1,000,000 worth of agriculture commodities through direct sales to consumers (San Mateo County Department of Agriculture/Weights and Measures, 2010).

Figure 13. Contribution to Total Agricultural Production Value by Crop Type, 2010

Overall, agricultural employment declined since 2000, losing nearly 1,500 employees between 2000 and 2008 (The Economic Vitality Research and Education Foundation (EVRE) & the San Mateo County Economic Development Association (SAMCEDA), 2010). Production values have declined over these years, but these trends mask the importance of the agricultural sector within the unincorporated county. In 2010, total gross value of agricultural products in San Mateo County totaled \$143,700,000. For every dollar of agricultural production, agriculture contributes an additional 1.6 to 3.5 times that value to the local economy (San Mateo County Department of Agriculture/Weights and Measures, 2010). Agriculture also provides opportunities for cleantech industry development, including natural pesticides, sustainable land management, and aquaculture.

Measure 11.1: Energy-Efficient Agriculture

Conduct a public outreach campaign to educate farmers and growers of easy and low- to no-cost energy efficiency practices.

Action Items:

- Work with farming associations to provide lists of more efficient agricultural equipment and support wholesale equipment acquisition.
- Partner with the County Department of Agriculture and other groups to promote energy-efficient practices.
- Pursue funding opportunities to facilitate the conversion of agricultural equipment to follow Carl Moyer standards.

MEASURE 11.1
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building,
 Agriculture/Weights &
 Measures
Co-Benefits



This program will support the existing efforts of the BAAQMD and the State to provide rebates or financing for retrofitting and replacing both on- and off-road heavy-duty equipment and vehicles through the Carl Moyer program. Additional education will be provided through the BAAQMD and other local partners on best maintenance and operations practices of off-road vehicles to maximize fuel efficiency.

Measure 11.2: Agricultural Best Practices

Create resources to promote best practices for agricultural management to establish a list of best practices for agricultural management.

Action Items:

- Collaborate with stakeholders such as the Farm Bureau, UC Cooperative Extensions, the USDA, Resource Conservation District, Natural Resources Conservation Service (NRCS), and other regional agricultural authorities and groups.
- Create a voluntary reporting program to track improvements in fertilizer use and promote agricultural leaders.
- Promote best practices such as soil tillage and fertilizer management.
- Develop a self-assessment program and facilitate voluntary audits for agricultural practices in partnership with farming stakeholders and organizations.
- Encourage low global warming potential (GWP) pesticides and fumigants.
- Work with farming associations to provide lists of more efficient agricultural equipment and support wholesale equipment acquisition.

MEASURE 11.2
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building,
 Agriculture/Weights &
 Measures
Co-Benefits






The County will collaborate with local and regional partners to support research and development of best practices. The intent of this measure is to help agricultural industries to implement cost-effective and revenue-enhancing practices that reduce GHG emissions. These recommendations for reducing GHG emissions are associated with soil and crop management, and encourage agriculture operators to continue to implement management practices that enhance and do not compromise the agricultural productivity of these lands.

GOAL 12: SUSTAINABLE AGRICULTURE

Encourage sustainable agricultural practices.

Agriculture is a managed form of land use where human intervention affects both biological processes that involve the transformation of carbon and nitrogen and physical processes such as leaching and runoff. Agricultural activities create direct and indirect GHG emissions through multiple processes, including fuel combustion in agricultural off-road equipment, crop and soil management practices, including soil fertilization and pest management, and emissions from cattle and other livestock.

Local and statewide agriculture-related GHG emissions result from a highly intensive modern industry sustained by ongoing human activities. Crop yields are dependent on inputs of fertilizer, manure, and pesticides that both directly and indirectly release GHGs. Other practices, such as the application of lime to the soil, work to achieve targeted levels of nutrients in the soil necessary to support agriculture. Practices vary by crop type, soil type, and terrain, among other factors.

Measure 12.1: Sustainable Agriculture

Streamline regulations for the farming community to support sustainable practices and GHG reductions.

Action Items:

- Simplify the permitting process for water permits and off-stream ponds for agricultural uses that can be used for summer irrigation and reduce use of stream and potable water.
- Consider allowing appropriate sustainable farming practices in non-farmed areas that will contribute to the County's land use goals, as appropriate based on activities to control erosion and other land impacts.
- Work with the Mid-Peninsula Regional Open Space District and stakeholders to identify appropriate agricultural uses.
- Encourage urban agriculture through zoning and land use designations, and support an expansion of certified farmers markets.

In addition to supporting GHG reductions through crop practices, the County will also streamline the regulatory framework to incentivize innovative agricultural practice. Efficient agricultural practices that support natural ecosystem functions will be encouraged and incentivized through new planning tools, such as special allowances or processes, as appropriate.

MEASURE 12.1
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building,
 Agriculture/Weights &
 Measures
Co-Benefits



GOAL 13: ZERO WASTE

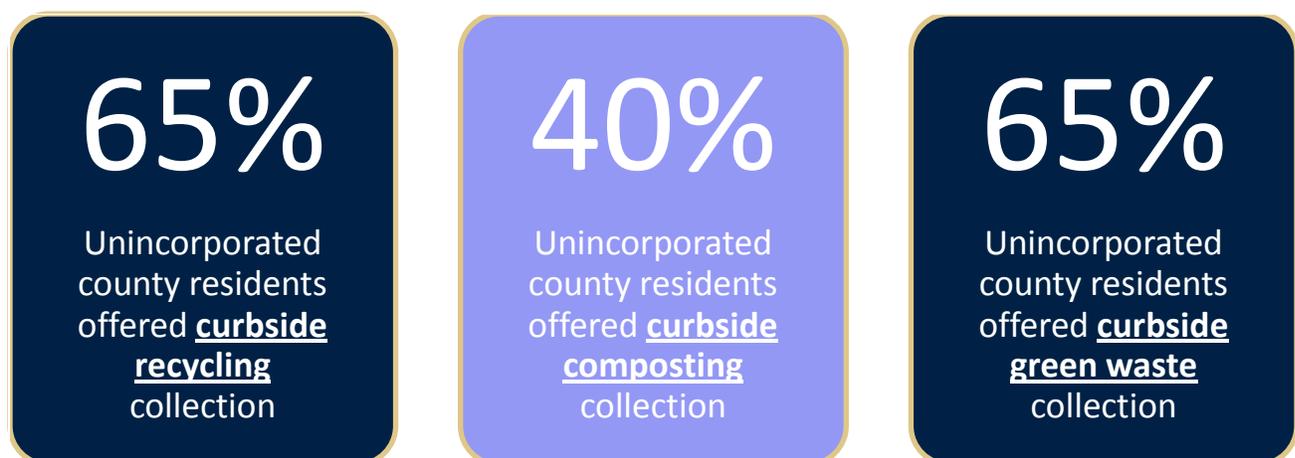
Achieve zero waste.

Both the consumption and the disposal of resources require energy and emit greenhouse gases. As waste is sent to the landfill, it decomposes and emits methane gas. By providing additional opportunities to recycle and compost, waste disposal trends within the community can be reduced, thereby reducing GHG emissions associated with waste disposal. Additionally, the impact of transporting waste from homes and businesses by waste fleet vehicles can be reduced through increased diversion and cleaner vehicle fleets.

The unincorporated county's residents and businesses are currently served by several curbside-recycling providers, including Recology of San Mateo County, The Coast, and San Bruno, and Allied Waste of Daly City and Half Moon Bay. However, due to the rural nature of the unincorporated county and the dispersal of communities, not all areas in the county are served by convenient curbside recycling or green waste services (see **Figure 14**). An estimated 45% of communities in unincorporated San Mateo County are not offered curbside recycling services for residents. Furthermore, only 30% of communities are eligible for commercial recycling. For those underserved communities, the County has set up designated residential recycling drop-off points in La Honda and Pescadero.

Despite these challenges, the County of San Mateo has conducted an active outreach campaign for waste reductions through RecycleWorks. This program provides information on recycling and waste programs, hosts events, and works to provide ongoing education to the community. This goal builds on these efforts, including an expansion of the use of recycled materials, in addition to expansions of curbside recycling, curbside green waste, and curbside collection of food waste. These measures will be implemented in partnership with waste service providers.

Figure 14. Gaps in Existing Waste Services in the Unincorporated County



Measure 13.1: Use of Recycled Materials

Require new development to incorporate a minimum of 15% of recycled materials into construction to encourage the market for recycled goods.

Action Items:

- Update construction and demolition requirements to include standards for recycled content.
- Provide through various County channels (including Planning and Building desks, RecycleWorks, and website, and provide directly to local design and construction professionals for their clients) printed and electronic information on available tax deductions and how much people can save by arranging for reusable materials to be taken from site pre-demolition (e.g., The ReUse People).
- Promote local enterprises that provide recycled goods.

The intent of this measure is to close the loop on recycled materials, encouraging development of a market for the use of recycled products. The use of recycled goods is also a standard identified in LEED and GreenPoint Rated, two sources of standards for the County's Green Building Ordinance.

Measure 13.2: Zero Waste

Work toward zero waste through comprehensive recycling and composting programs, in addition to aggressive outreach efforts.

Action Items:

- Adopt recycling ordinances that incorporate new standards for trash, recycling, and composting collection enclosures. For example, require enclosures to accommodate two 4-yard containers.
- Nominate county businesses with high diversion rates for recognition through CalRecycle's Waste Reduction Awards Program (WRAP).

MEASURE 13.1
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Public Works, Planning &
 Building
Co-Benefits



There are three primary options to reducing waste that is sent to the landfill:

- Reduce, Reuse, or Recycle

MEASURE 13.2
2020 GHG Reduction
 14,900
2035 GHG Reduction
 21,960
Responsible Department(s)
 Public Works, Planning &
 Building
Co-Benefits



- Work with trash providers to increase the types of recyclables and organic materials that trash collection services will accept for recycling.
- Continue outreach efforts through RecycleWorks programs.
- Work with apartment building owners and managers to implement recycling programs.
- Work with waste providers to provide food waste services for commercial restaurants and curbside composting or centralized composting drop-offs for residential customers.
- Encourage the provision of green waste options for all residents and all applicable commercial properties.
- Collaborate with landfill operators and owners to investigate the feasibility of expanding services to include local composting facilities and resources.

This measure identifies the County's commitment to work with service providers to sustain ongoing waste reductions. The County will ensure that as many residents and businesses as possible will have the opportunity to recycle cardboard, glass, paper, and plastic products at little or no cost. Recycling these products instead of disposing them in the landfill reduces methane emissions associated with the decomposition of these materials. The County is also working to expand curbside composting services for unincorporated communities. Additionally, the unincorporated county does not have a composting facility. Through this measure, the County will collaborate with landfill operators and waste haulers to investigate opportunities for local facilities to receive composting from the unincorporated county and support increased waste reductions.

Measure 13.3: Waste-to-Energy Facility

Investigate the creation of an agricultural and food waste-to-energy (WTE) biomass facility in San Mateo County.

Action Items:

- Work with regional and local partners to identify opportunities for partnership and expansion of WTE enterprises.
- Partner with other landfill operators in the unincorporated county to actively recruit WTE companies.
- Using existing economic development efforts, identify potential incentives to market to WTE companies.

MEASURE 13.3

2020 GHG Reduction

Supportive Measure

2035 GHG Reduction

Supportive Measure

Responsible Department(s)

Planning & Building, Public Works

Co-Benefits




Waste-to-energy facilities in California act as revenue generators and provide a potential waste diversion credit to jurisdictions. These technologies also provide a potential renewable energy source (see Measure 4.10). Several waste-to-energy technologies exist, ranging from the conversion of traditional waste to green waste into fuel. Through the conversion of waste into fuel, these facilities provide the potential to reduce GHG emissions that would otherwise take place through waste decomposition while attracting regional waste as a revenue-generating product for conversion.

Measure 13.4: Landfill Gas Capture

Continue to monitor and promote emerging technologies to increase landfill gas capture and combustion efficiency and to reduce fugitive emissions in each process.

Action Items:

- Showcase the Ox Mountain Landfill as a leader in landfill gas management.
- Investigate the feasibility of installing landfill gas capture and combustion systems (gas-to-energy) at closed landfills within the unincorporated county.

MEASURE 13.4
2020 GHG Reduction
 Supportive Measure
2035 GHG Reduction
 Supportive Measure
Responsible Department(s)
 Planning & Building, Public
 Works
Co-Benefits



The Ox Mountain Landfill has been in operation since 1976. As of 2001, the landfill had over 9.13 million tons of waste in place. In 2009, landfill operators began using reciprocating engines to capture methane emissions from the landfill to create electricity. This approach utilizes energy resources that would otherwise be wasted and contribute to GHGs to generate revenue and serve Palo Alto and Alameda Municipal Power.

Receiving national recognition from the EPA for its ambitious efforts, the landfill serves as an important model for GHG reductions and renewable energy production. The County will build on this example and seek additional opportunities to use landfills as revenue-generating and electricity-generation resources. The amount of GHG reductions from this measure is not calculated. These actions are considered supportive with no direct quantifiable benefit, in part because existing emissions from landfills are not included in the baseline GHG inventory.

GOAL 14: WATER CONSERVATION

Reduce water use 20% by 2020.

Water consumption requires energy to pump, treat, distribute, collect, and discharge water as it is used by the community, which results in greenhouse gas emissions. Greenhouse gas emissions also occur as a direct process from wastewater treatment. Despite a fragmentation of water service providers throughout the unincorporated county, conservation and more efficient use of water are both important strategies to

reducing GHG emissions from water use. Water reductions also prepare the County to adapt to the reduced water availability that may occur due to a changing climate.

The County is already undertaking a certain measures to encourage and/or require water conservation. For example, the County is subject to and enforces the State of California’s Model Water Efficient Landscape Ordinance, which requires water-efficient landscaping for larger new construction projects. In addition, certain zone districts within the County, such as the Design Review (DR) district as it applies to single-family residential development the MidCoast, require the use of drought-tolerant and/or native or non-invasive landscaping in new construction projects.

This goal identifies additional opportunities to reduce energy-intensive water consumption from both new construction projects and existing development. Through the implementation of water efficiency measures and increased use of recycled water, the need to procure additional water sources in the future will be reduced.

Measure 14.1: Smart Water Meters

Work with water companies that serve the community to install smart water meters on 50% of residential and commercial customers by 2015 and 95% by 2020.

Action Items:

- Support and promote efforts to install smart water meters.
- Promote successful projects using smart water meters to reduce water use.

Smart water meters are very similar to smart electric meters being installed across San Mateo County by PG&E except they monitor water use as opposed to electricity. Since smart water meters monitor and record water use throughout the day, residents and businesses are able to see how and when they use water throughout by the hour. Many meters also alert customers of leaks, which saves money and resources.

MEASURE 14.1
2020 GHG Reduction
140
2035 GHG Reduction
140
Responsible Department(s)
Planning & Building, Public Works
Co-Benefits



Measure 14.2: Water Reuse

Increase the use of grey, rain, and recycled water for landscaping and agricultural purposes throughout the community to reduce the use of potable water.

Action Items:

- Partner with urban providers to provide recycled water to the more built-up communities in San Mateo County, focusing on North Fair Oaks.
- Require new development in the County's area plans to provide dual plumbing in anticipation of available recycled water, and update countywide standards related to water reuse.
- Work with wastewater providers to investigate the feasibility of a recycled water system throughout the county.
- Pass an ordinance allowing do-it-yourself methods for greywater systems that meet public health and safety standards. Target areas with leach fields and septic tanks for outreach and education on greywater systems, which are areas that would not otherwise be impacted by regulations and incentives for sewer systems.
- Provide education on options for affordable greywater systems that provide adequate treatment.
- Provide permit incentives for greywater systems that follow the County's Environmental Health best management practices.

In the North Fair Oaks Community Plan, the County adopted mandatory standards for new development to provide greywater plumbing within that planning area. In this Community Plan, the County also adopted policies to incentivize greywater and rainwater capture. Greywater strategies in this EECAP provide a foundation for the County to apply to other unincorporated areas.

MEASURE 14.2

2020 GHG Reduction

30

2035 GHG Reduction

60

Responsible Department(s)

Planning & Building, Public Works, Environmental Health

Co-Benefits







GOAL 15: OFF-ROAD EQUIPMENT

Support expansion and use of clean technology off-road equipment.

Off-road emissions include those from lawn and garden equipment and construction activity. While these emissions constitute a relatively small portion of the GHG inventory, it is important that the County make an attempt to reduce emissions from each emissions source. This measure calls for more efficient fuels, equipment, and vehicles in construction and lawn and gardening activities.

Measure 15.1: Construction Idling

Adopt ordinances and policies that aim to reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles to exceed the Bay Area Air Quality Management District's (BAAQMD) requirements.

Action Items:

- Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes.
- Require maintenance of construction equipment per manufacturer specifications.
- Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting measures identified by the Bay Area Air Quality Management District.

MEASURE 15.1

2020 GHG Reduction
7,290

2035 GHG Reduction
14,040

Responsible Department(s)
Planning & Building, Public Works

Co-Benefits






Construction vehicles and equipment may be powered by cleaner alternative means such as a hybrid unit, biodiesel, or compressed natural gas fuels. These alternative options burn more cleanly and are consistent with BAAQMD guidelines and requirements. The County will work to implement this measure by relying on BAAQMD's list of measures.

Measure 15.2: Electrification in New Homes

Facilitate the conversion of outdoor household equipment to more efficient models.

Action Items:

- Encourage and support programs that replace conventional lawn mowers and gardening equipment with electric versions through materials, on the County's website, and at public events.
- Support the Bay Area Air Quality Management District's (BAAQMD) efforts to re-establish a voluntary exchange program for residential lawn mowers and backpack-style leaf blowers.
- Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.

Lawn and garden equipment was previously exempt from regulations seeking to reduce GHG from small internal combustion engines. Equipment powered by electricity or battery packs for small machinery have become more advanced and effective, but the industry standard is gas-powered machinery. The County will work to encourage the turnover of existing equipment to more efficient alternatives. Further, by ensuring that new development has the necessary electrical outlets, the County will additionally support the use of cleaner, electric lawn and garden equipment.

MEASURE 15.2

2020 GHG Reduction
140

2035 GHG Reduction
140

Responsible Department(s)
Planning & Building,
Housing in partnership with
other departments to be
determined

Co-Benefits




GOAL 16: FOREST HEALTH & SEQUESTRATION

Protect long-term forest health and sequestration capacity for climate change resilience.

Opportunities related to GHG emissions and the forestry sector include storage and sequestration of CO₂. Sequestration is an emerging field of research in agriculture and natural resource management. At this time, the exact role of local resources, including forestry, is largely unknown. Collaboration and research among agency, institutional, and agricultural organizations are necessary to assess opportunities for sequestration to serve as a local mitigation opportunity.

San Mateo County is home to some of California's most magnificent redwood forests, including redwood trees on County parkland. The Pescadero Park Complex, Wunderlich County Park Heritage Grove, and Huddart Park all provide trails and extensive forest habitats. These protected county areas provide key opportunities to test and demonstrate the value of long-term carbon sequestration.

Measure 16.1: Promote Sequestration Efforts

Identify opportunities for forestry sequestration on County lands, including but not limited to publicly owned forests and parks.

Action Items:

- Create a Blue Ribbon Forestry Advisory Committee to facilitate pilot forestry sequestration projects and identify work programs and research, including representatives from groups such as the Sierra Club, Sustainable San Mateo County, San Mateo County Parks Foundation, Pescadero Conservation Alliance, Peninsula Open Space Trust, Committee for Green Foothills, and government representatives from the County Sheriff, County Public Works, County/Cal Fire, the California Department of Fish and Game, the local forestry industry, and the local communities of Loma Mar and La Honda.
- Support preparation of a countywide sequestration assessment of open space and forestlands.
- Investigate opportunities to generate revenue for sequestration through conservation-based mitigation banking and carbon offset programs.

MEASURE 16.1

2020 GHG Reduction

Supportive Measure

2035 GHG Reduction

Supportive Measure

Responsible Department(s)

Parks Department

Co-Benefits




Carbon sequestration is the net removal of CO₂ from the atmosphere. This may occur through the enhancement of natural processes (i.e., terrestrial sequestration—the uptake of carbon by trees, vegetation, and soils) or through technological processes, such as the placement of CO₂ into a geologic repository (geologic sequestration) in such a way that it will remain permanently sequestered. The term “carbon sinks” is also used to describe agricultural and forestry lands that absorb CO₂. This measure directs the County to create a long-term advisory committee to explore opportunities for carbon sequestration on County parkland. The County will involve partners from community groups, stakeholders, and County representatives. This Blue Ribbon Forestry Advisory Committee will identify a viable work program for demonstrating the potential for sequestration while improving forest health.

GHG REDUCTION SUMMARY

This Energy Efficiency Climate Action Plan identifies a clear path to achieve the County's 17% reduction target while exceeding the minimum state and BAAQMD requirements. The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs for both new and existing development. The reduction measures also aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, existing actions, state programs, and GHG reduction measures in this Plan will reduce GHG emissions in the unincorporated county in 2020 by 213,400 MTCO₂e. Local reductions contribute approximately 30% of these reductions, or 67,000 MTCO₂e by 2020. **Table 7** and **Figures 15** and **16** demonstrate the GHG reductions achieved by each primary, quantifiable goal for 2020. Supportive goals without direct GHG reductions associated with them are not included in these summaries.

Table 7. 2020 GHG Reductions by Topic (MTCO₂e)

| Goal Topic | 2020 | 2035 |
|-------------------------------------------------|--------|---------|
| Residential Energy Efficiency | 5,630 | 10,590 |
| Commercial Energy Efficiency | 15,580 | 43,490 |
| Green Building Ordinance | 6,780 | 69,270 |
| Renewable Energy | 6,480 | 35,420 |
| Transportation | 7,100 | 6,400 |
| Alternative Fuels | 1,780 | 2,200 |
| Waste Diversion | 15,010 | 22,140 |
| Water Efficiency | 170 | 200 |
| Sustainable Agricultural Practices ¹ | - | - |
| Off-Road Technologies | 8,470 | 16,740 |
| Sequestration ¹ | - | - |
| Totals | 67,000 | 206,450 |

1. Not quantified; supportive goal topics.

Figure 15. 2020 Emissions Reductions by Goal Topic

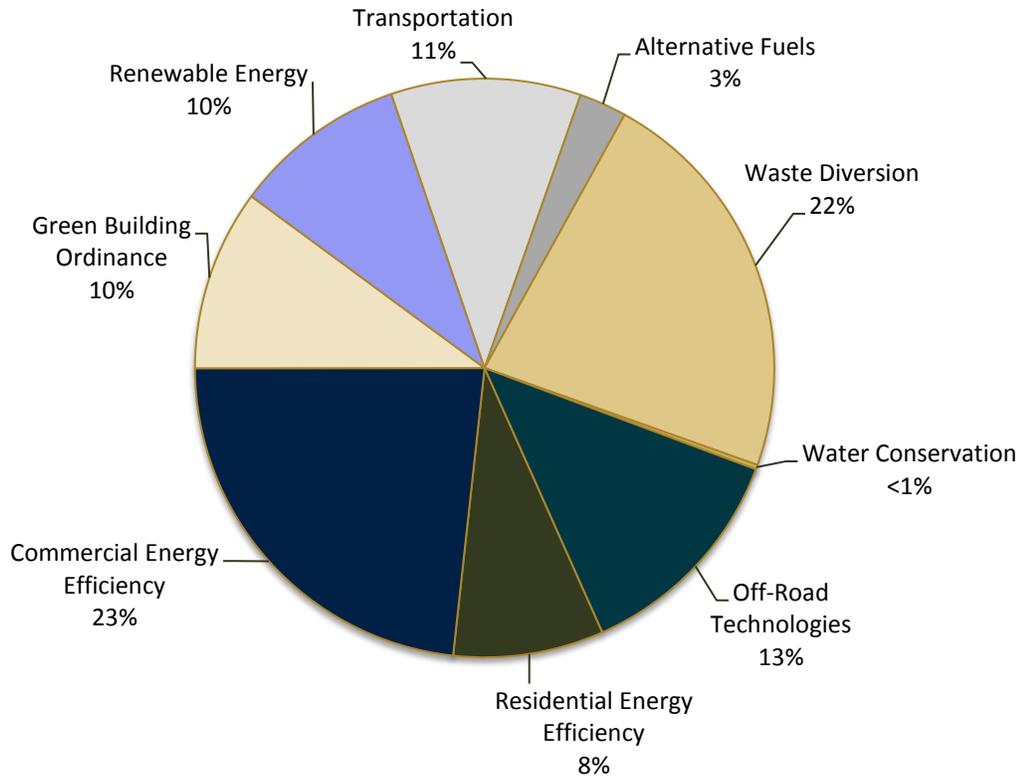
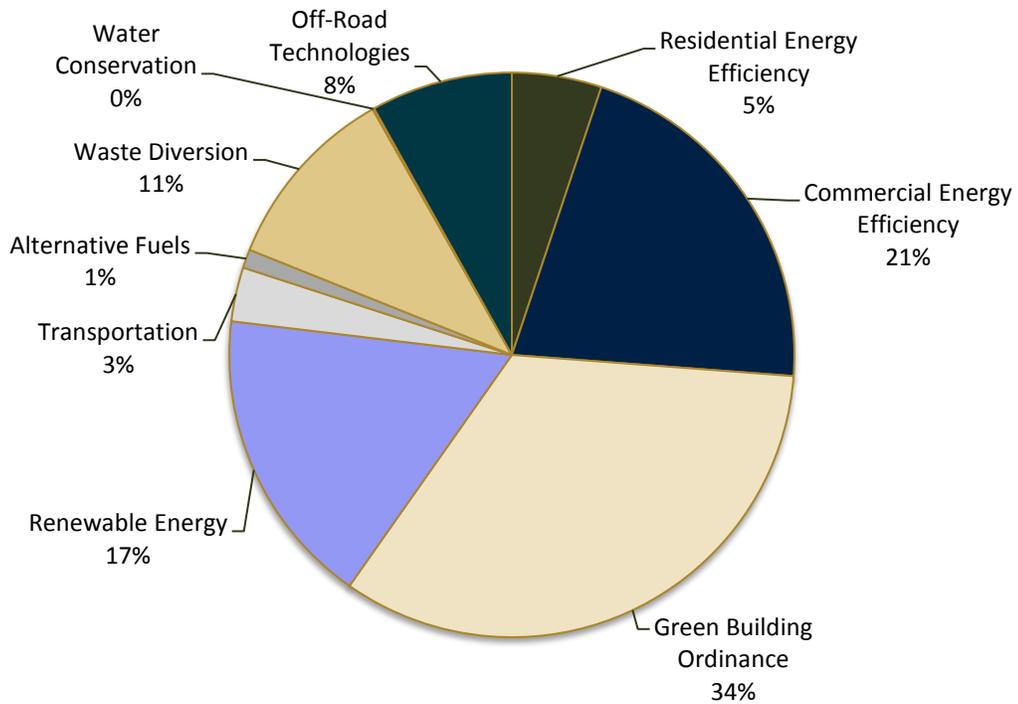


Figure 16. 2035 Emissions Reductions by Goal Topic



The most significant emissions reductions by goal topic are projected to occur in the goal topic areas of commercial energy efficiency, green building ordinance, renewable energy, waste diversion, and off-road technologies, although this varies somewhat depending on the timeframe chosen. In terms of specific implementation measures, the most significant emission reductions are projected in the following:

- Measure 2.3: Institutional Energy Efficiency
- Measure 3.2: Green Building Incentives
- Measure 13.2: Zero Waste
- Measure 15.1 Construction Idling

Again, this depends in part on the time frame used. In addition, some measures, such as Measure 4.9 Emissions Offset Programs, have a much more significant impact when looking at the 2035 timeframe compared to the 2020 timeframe.

Complete implementation of this Plan will allow the County to achieve a 17% reduction of GHG emissions 2005 levels by 2020 and will set the County on a trajectory to achieve the state GHG reduction target set by Executive Order S-3-05 of reducing GHG emissions 80% below 1990 levels by 2050. **Figure 17** shows the County's anticipated progress toward achieving the GHG reduction target through the implementation of this Plan.

ADAPTATION

This chapter identifies the County's proactive efforts to assess unique risks in the county and to adapt to the long-term impacts of climate change.



INTRODUCTION

The greenhouse gas (GHG) reduction efforts presented in **Chapter 4** are critical to the long-term health of the county, but the effects of climate change have already occurred and will continue to occur throughout San Mateo County despite these efforts. The effects of climate change have the potential to impact county residents and businesses unless steps are taken to adapt to or manage potential changes to the local environment and socioeconomic systems to reduce risks and increase resilience. Climate adaptation refers to the “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities” (IPCC 2007).

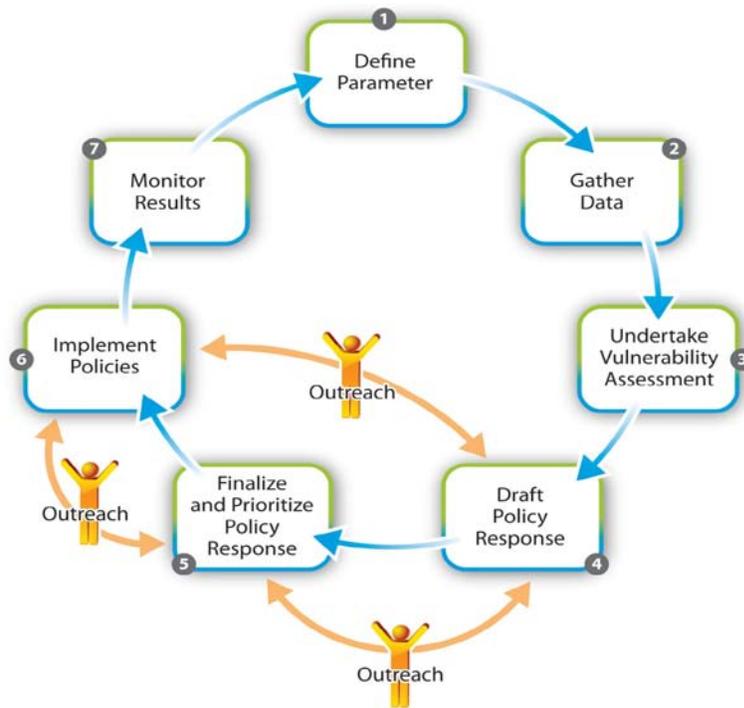
This chapter identifies adaptation policies that address potential impacts of climate change in general and specifically for the following sectors:

- Agriculture and forestry
- The built environment
- Natural resources
- Fire
- Public health
- Water

STEPS TO ADAPTATION PLANNING

Climate change adaptation planning is not a static exercise but is an iterative process that will respond to changing priorities and opportunities. This iterative process is depicted below in **Figure 18**. This chapter will guide County actions to make communities more resilient. Starting with an understanding of the problem, the chapter provides the framework for developing policy, identifying implementation actions, and monitoring the progress of adaptation efforts.

Figure 18. San Mateo County Adaptation Planning Framework



VULNERABILITY ASSESSMENT

To understand the potential local impacts and risks associated with climate change in the unincorporated county, the County examined facilities and resources that are vulnerable to changes in temperature, sea level, and precipitation. The San Mateo County Climate Change Vulnerability Assessment (Vulnerability Assessment) was prepared in 2011 as a collaborative effort between ICLEI-Local Governments for Sustainability, PMC, and San Mateo County's Planning and Building Department as well as the San Mateo County Vulnerability Assessment Working Group. The working group included staff representatives from County departments such as Parks and Recreation, Planning, Public Health, and Public Works and external experts and stakeholders, including the San Francisco Bay Conservation and Development Commission (BCDC), the California Coastal Commission, the California Department of Forestry and Fire Protection (Cal Fire), and Pacific Gas and Electric

(PG&E). The working group provided local data and information needed to create the analysis. The findings of the Vulnerability Assessment are presented in this chapter. Readers should note that content from the Vulnerability Assessment is presented verbatim in this chapter rather than paraphrased to maintain accuracy in representation.

The Vulnerability Assessment includes three primary components – exposure, sensitivity, and adaptive capacity – each of which contributes to the overall vulnerability of a functional system. Exposure is a determination of whether the system will experience a specific changing climate condition or impact. Sensitivity is the degree to which the system would be impaired by the impact if it were exposed. Adaptive capacity is the ability of the system to change in order to maintain its primary functions even as it is exposed to an impact. When a system is exposed, with high sensitivity and low adaptive capacity, it is likely to be vulnerable to impacts (San Mateo County 2011). The exposure assessment was used to identify key impacts that San Mateo County will probably face. In cases where an impact was identified, sensitivity and adaptive capacity levels were used to create a vulnerability level. Finally, the potential timing of impacts was used to create an additional screen to determine the unincorporated county's greatest current threats.

The resultant Vulnerability Assessment identified general risks and specific facilities and conditions that would experience increased risks as the result of changing environmental conditions. While adaptation issues are expected to evolve over the next 100 years, the Vulnerability Assessment examines a point in time to establish the baseline for discussion and analysis of issues facing the County. This “snapshot” is expected to change in response to new information, changing priorities, and the implementation of adaptation strategies. To reflect this condition, this chapter establishes the policy framework for addressing adaptation and resilience issues over time.

Based on the risk of the impact (a function of likelihood and potential consequences) and the extent of County jurisdiction or influence over the affected system, the following six focus areas were identified for the Vulnerability Assessment.

1. Agricultural system considerations including farms and managed timber.
2. Threats to built infrastructure in the coastal zone on both the bay and the ocean from sea level rise.
3. Threats to coastal ecosystems on both the bay and the ocean from sea level rise.
4. Property and safety threats from an increased incidence of wildfires.
5. Public health threats from increased temperatures.
6. Impacts on water supply.

Stakeholder participation

Based on the comparative vulnerability and risk assigned to asset areas identified in the Vulnerability Assessment, adaptation issues were presented for feedback by the EECAP Technical Advisory Committee, EECAP Steering Committee, and County staff during preparation of the Vulnerability Assessment in July–November 2011. On April 10, 2012, the County held a workshop where residents were invited to review, comment, and prioritize the resultant list of issues. Following the workshop, the team prepared draft measures to address climate change for presentation in this plan.

CLIMATE CHANGE PROJECTIONS AND PRIMARY IMPACTS

The three changing climate conditions or primary impacts that are projected to affect the San Mateo County region are temperature, precipitation, and sea level. The unincorporated county's built environment and natural resources face serious risks from the potential impacts of sea level rise. Impacts to public health from increases in temperature could also be dramatic. The following climatic and environmental conditions in San Mateo County were used to formulate an adaptation strategy.

Temperature – Temperatures in San Mateo County are expected to increase between 1 and 2 degrees (estimated to increase 1.6 degrees) Fahrenheit by 2030 and between 2 and 3 degrees (estimated to increase 2.8 degrees) Fahrenheit by 2050. Examples of possible impacts from these changes include increased public health threats; increased wildfire incidence; decreases in water availability for drinking, habitats and agriculture; change in fog patterns; and impacts on species survival, ranges, and distribution.

Precipitation – Climate model projections for San Mateo County anticipate moderate changes in annual precipitation. In San Mateo County, it is difficult to decipher precipitation trends due to extreme annual variability that is influenced by non-climate-change factors. A statewide assessment found that California will probably retain its current basic precipitation pattern and will continue to have a high likelihood of extreme dry weather events. The statewide assessment indicates that precipitation patterns in San Mateo County will experience increasing variability. This variability means that rain events could be more extreme followed by prolonged dry weather periods. Examples of possible impacts from these changes include increases in frequency and magnitude of flooding events and drought events, decreases in water availability for drinking, habitats and agriculture, and threat to forest health.

Sea Level Rise – Over the last century, California has observed a nearly 8-inch rise in sea levels along the coast. In the county, models predict an average of 7 inches above 2000 baseline levels by 2030 and an average of 14 inches above year 2000 baseline levels by 2050. By 2100, the scenarios range from an average of 40 inches above year 2000 baseline to an average of 55 inches of above baseline.

As with temperature, it is not simply that sea levels will rise, but also that extreme events will inflict more damage. There will be an increased rate of extreme high sea level events, which occur when high tides coincide with winter storm events and El Nino-Southern Oscillation³ (ENSO) occurrences. The Vulnerability

³ ENSO is a periodic cycle of higher ocean temperatures and air surface pressure in the tropical Pacific Ocean region that can lead to higher water levels on the west coast of the United States.

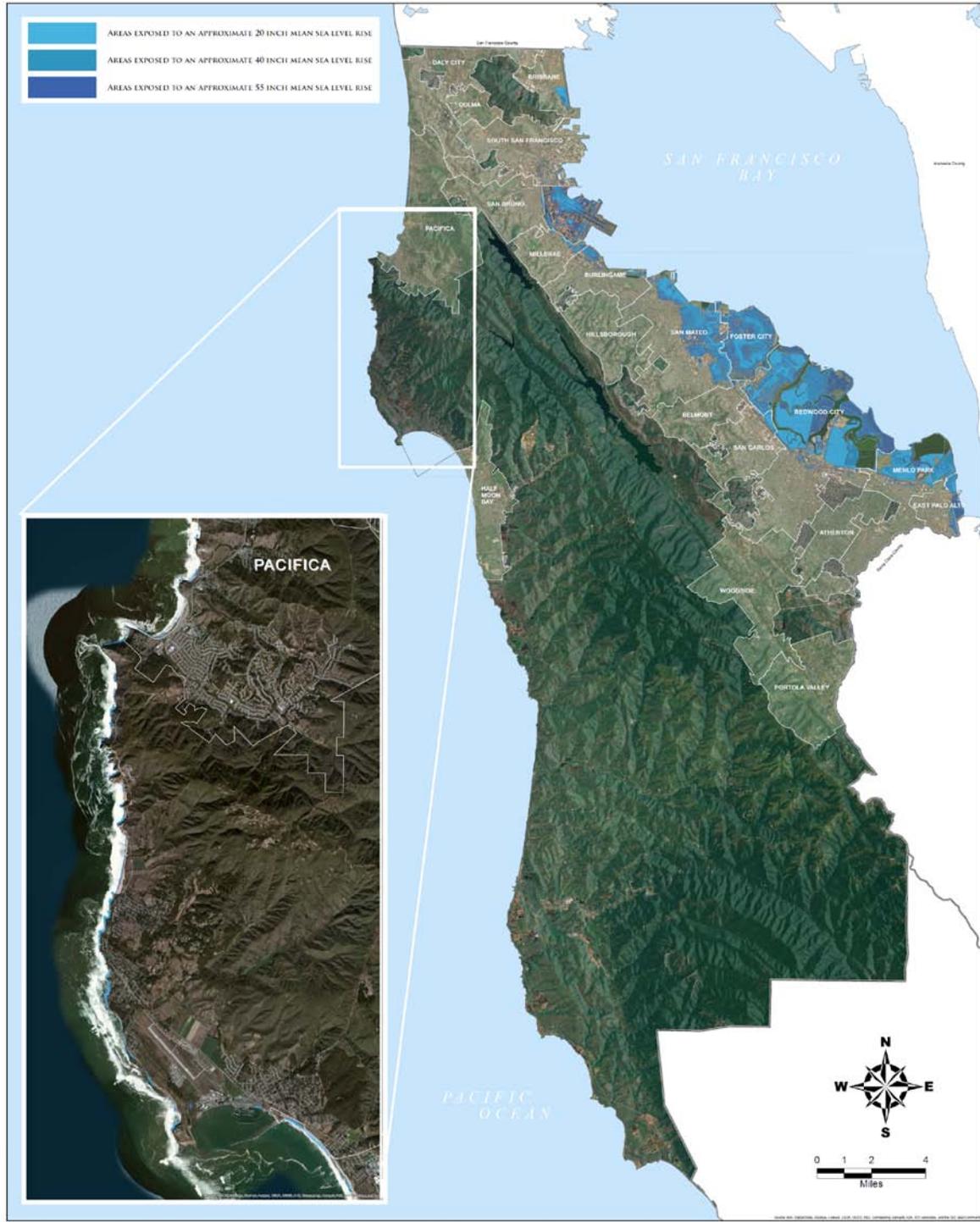
Assessment considered that both sea level rise and potential changes in storm events can result in the following five impacts in the coastal zone.

- **Flooding:** In areas already prone to flooding, these events are likely to become more frequent and last longer. Additionally, flooding is expected to impact locations that are not currently at risk.
- **Inundation:** Areas that are not currently within the tidal range will shift to being in the tidal range and will therefore experience frequent or even permanent salt water cover.
- **Erosion:** Higher water levels cause changes in wave activity which can cause erosion along non-hardened shorelines to increase.
- **Water Table Rise:** Commonly referred to as the top of the freshwater aquifer, the rise in sea water can cause some freshwater aquifers to rise. This shift reduces the area considered buildable for underground structures such as pipes and basements. In addition, it is possible that a rise in ground water levels could potentially result in heightened risk of liquefaction during an earthquake.
- **Salt Water Intrusion:** Higher seas can cause salt water to enter into freshwater aquifers, contaminating parts of the aquifer.

Areas in San Mateo County most at risk for sea level rise include inland bay shoreline areas but are primarily focused on coastal shoreline areas. This is because almost all of the bay shoreline areas are within incorporated cities, rather than the unincorporated county, with a few exceptions. There are also two mobile home parks partly located in unincorporated Redwood City that are very close to the San Francisco Bay shoreline. There are other unincorporated areas such as the Harbor Industrial area in unincorporated Belmont, another mobile home park in unincorporated Redwood City near Highway 101, and portions of unincorporated North Fair Oaks in the vicinity of Bay Road that are in the area subject to increased inundation as shown on the map in **Figure 19**. In addition, there are County-owned and -operated facilities located within incorporated cities, such as the Coyote Point County Recreation Area which is located within the City of San Mateo, and the County's Maple Street Correctional and related facilities which are located within incorporated Redwood City.

Many of these unincorporated bayside locations and County facilities within incorporated cities, with the notable exceptions of San Francisco International Airport (SFO), Coyote Point, and the Maple Street facility, are located behind levee systems that are located within incorporated cities, such as Redwood City. The County has limited direct jurisdiction over these levee systems. SFO is conducting a separate climate action planning process. However, the County can play a leading role in coordinating with incorporated cities, BCDC, the US Army Corps of Engineers, and other regional, state, and federal entities as well as a variety of private interests and non-governmental organizations in preparing for sea level rise impacts in the vicinity of the San Francisco Bay shoreline. Other specific areas of vulnerability include areas that will be subject to increased inundation (for example, Surfers Beach at Highway 1) and erosion (for example, Seal Cove). Areas exposed to sea level rise are shown in **Figure 19**.

Figure 19. Sea Level Rise in San Mateo County



SOURCE: Knowles, Nich, 2010. Potential Inundation Due to Rising Sea Levels in the San Francisco Bay Region. San Francisco Estuary and Watershed Science, U.S. Geological Survey. Political Boundaries by San Mateo County Planning & Building Department, 2010.
 COLUMBIA: Inundation estimates not account for existing shoreline protection or wave activity. These maps are for informational purposes only. Users, by their use, agree to hold harmless and indemnify the State of California and its representatives and its agents for any liability associated with its use in any form. The maps and data shall not be used to assess actual coastal hazards, insurance requirements, or property values or located in line of Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA).

POTENTIAL THREATS AND VULNERABILITIES OF CLIMATE CHANGE IMPACTS

Based on the assessment of climate change impacts summarized above, the Vulnerability Assessment provides an evaluation of the sensitivity of the unincorporated county's functions, structures, populations, and natural resources to the impacts, as well as an assessment of the timing of potential impacts and capacity to accommodate or adapt to change. The findings are summarized below.

Increased Rate of Fires – Changes in vegetation patterns within the county due to higher temperatures and changes in precipitation will probably cause an increased risk of fires. The projected increase in frequency and size of fires in the county has the potential to greatly increase demand on local emergency services and water supply while negatively impacting the county's air quality, native ecosystems, and land productivity.

- Undeveloped lands and structures in the urban rural interface could see more fire events, and those areas that are considered "less" fire-prone today have the potential to become "more" fire prone with climate change.*
- Water supply and associated infrastructure could be destroyed by wildfires.
- Sensitive habitats may be vulnerable due to increased incidence of fire and species could be lost.

Loss of Natural Resources – Rising sea levels have the potential to significantly alter natural ecosystems and wildlife habitats, particularly beaches, wetlands, and tidal pools. Increased inundation can interrupt wildlife migration patterns and corridors. As climate change progresses, migratory birds and rare or endangered species might respond by shifting their habitats inland in an effort to track suitable climate conditions.

Increased Forestry and Agricultural Vulnerability – Higher temperatures, decrease in water supply, and shifts in seasonal changes have the potential to negatively affect agricultural and forestry resources and productivity, resulting in a loss of food security and decrease in sequestration resources.

- Agricultural productivity is vulnerable to changes in water availability.*
- Forest health is vulnerable to lower rainfall levels and higher temperatures.
- The health of the forest, which is contingent upon temperatures, precipitation, and the lack of pests, greatly influences the forest fire threats in the county. Conversely, the lack of devastating fires generally contributes to the health of the forest, notwithstanding the ecological benefits of limited periodic burns.

Deteriorating Public Health – Public health might be substantially impacted by environmental conditions due to climate change. For example, changes in temperature and rainfall could decrease water supplies and increase the risk of fires, which have a detrimental effect on local air quality. Increased average temperatures combined with unpredictable weather occurrences can result in more extreme heat and cooling events, and

unless actions are taken to protect the county's population, increased mortality and asthma-related admissions to local hospitals can happen.

- Users of outdoor recreation areas could be vulnerable to heat health risks where these areas lack proper shade, facilities, and public awareness.
- Low-income and other residents may be vulnerable to extreme heat events due to their limited ability to cool their homes.
- People with impaired respiratory systems will be vulnerable to heat-related air quality impacts and experience higher hospitalization and mortality rates.
- Elderly populations, infants, children, and outdoor workers generally will be vulnerable to health risks due to increases in extreme heat events.*

Decreased Supply of Fresh Water – Higher temperatures and continued population growth suggest that there will be a growing demand for water while local groundwater and reservoir supplies are shrinking. Increased temperatures would expose populations to more frequent heat days, and a decrease in coastal fog will also significantly increase the temperatures of coastal communities, resulting in increased electricity and water use as residents cool themselves.

- Water supply districts that rely on surface waters could have supply interrupted more frequently by changes in precipitation patterns.
- Water supply that relies on Sierra Nevada snowpack will be vulnerable to changes in the quantity of snowpack and timing of snow melt.

Increased Severity of Flood Events – Climate model projections indicate that rainfall events will probably occur less frequently but with greater severity. While these rainfall events may not significantly change total annual precipitation, they will pose additional challenges to managing runoff, sedimentation, soil water retention, and water storage. The combination of fire events followed by large amounts of rainfall can cause severe soil erosion, sedimentation runoff, and mudslides or landslides. Areas in San Mateo County have been determined by the Federal Emergency Management Agency (FEMA) to fall within 500- and 100-year floodplains. Areas within the floodplains will be more vulnerable to the heightened flooding threats that are anticipated to result from climate change. Impacts could also be magnified by a combination of high tides, storm events, and sea level rise. Localized flooding of low-lying areas will continue to be a concern as rainfall events become more severe.

* Starred vulnerabilities are those that have been identified as already occurring, whether due directly to climate change or because the threat exists for other reasons.

- Public access and recreation are vulnerable to flooding and erosion, including loss of beaches and trails, in low-lying locations such as Coyote Point Recreation Area and Coyote Point Marina.*
- Sewer systems in certain areas could be vulnerable to flooding and could experience backups, and sewer districts could experience localized flooding due to sea level rise.
- Homes and businesses are vulnerable to more frequent problems with localized impacts due to storm drainage backups in low-lying areas such as North Fair Oaks, Pescadero, Princeton, and Moss Beach.*
- Homes or other structures and systems, particularly septic system leach fields near coastal bluffs, could be destroyed due to increased bluff erosion.*⁴
- Certain sections of major roads, specifically Highway 1 near Surfers Beach and Devil's Slide, as well as local county roads could be lost or destroyed by erosion and landslides.*
- Wastewater treatment plants and related infrastructure such as sewer mains, pumps and treated effluent outfalls could be impaired by sea level rise, potentially resulting in backups and overflows.

Shoreline Damage – Sea level rise is attributed to the increase of ocean temperatures and the resulting thermal expansion and melting of ice sheets, which contribute to the volume of water held in the oceans. The speed and amount of sea level rise will be determined by the increase in average temperatures and rate of melting of glacial ice. While there is a degree of uncertainty in the magnitude of projections, to date, the actual impacts of climate change have been more severe than the projections. While the unincorporated area of San Mateo County has very little bay shoreline, it has more than 50 miles of coastal shoreline. Facilities that are essential to the county function might be at risk and sea level rise will probably have the following effects on the coastal shoreline:

- Increased erosion of coastal bluffs and risk of additional slides and cliff failures.
- Higher storm surges and coastal flooding, making transportation and local infrastructure vulnerable to inundation during storms.
- Increased infrastructure and maintenance costs to protect local harbors and ports from extreme events and sea level rise.
- Loss of coastal beaches, wetlands, and tidal areas due to permanent inundation.
- Saltwater intrusion into coastal freshwater supplies that serve local residents and agricultural land uses.

* Starred vulnerabilities are those that have been identified as already occurring, whether due directly to climate change or because the threat exists for other reasons.

Three climate change threats were identified at a late stage in the assessment and could not be directly addressed in the Vulnerability Assessment; however, these threats should be noted as they are concerns for San Mateo County.

- The electrical system may be exposed due to aboveground wires that go through wetlands and mountain areas, and put at risk due to fire or flooding.
- Underground electricity distribution lines may be impacted by increased moisture in the soil and saltwater corrosion due to sea level rise.
- Bluff erosion in areas of old septic system leach fields could result in a public health impact at public beaches and other nearby open spaces.

COUNTY ADAPTATION STRATEGY

This adaptation strategy is the starting point for the County's coordinated efforts on adapting to the impacts of climate change. This strategy presents key actions for the County to initiate, support, and maintain through 2020, concurrent with actions to reduce or mitigate countywide greenhouse gas emissions. Best practices direct local governments to coordinate and integrate short-, medium-, and long-term policy, infrastructure, and programmatic decisions across sectors as part of a comprehensive climate change adaptation strategy. In order to effectively adapt to the impacts of climate change, the County will need to continue to identify potential impacts through research, projections, and observations and implement policies to reduce these impacts.

There are two types of adaptation measures: (1) operational changes and (2) increases to adaptive capacity. Operational measures assess climate change vulnerabilities and sensitive populations on a regular basis. They also address climate change adaptation in planning and public safety documents.

Adaptive capacity measures are strategies that help prepare for and adjust to the impacts of climate change. Examples include the establishment of cooling centers during heat waves, promotion of energy efficiency and renewable energy to reduce peak load demand, and implementation of low impact development standards to reduce stormwater runoff and increase groundwater recharge.

The San Mateo County adaptation strategy should take advantage of the full spectrum of available resources that can support both operational changes and adaptive capacity. To facilitate implementation, areas of vulnerability have been organized to:

- 1) Identify the systems, resources, and assets that are likely to be affected by climate change-related impacts (for example, buildings, utilities, emergency response, or ecosystems).
- 2) Establish causal links between system components, resources, and assets to identify vulnerable points.
- 3) Provide information about the relationships between vulnerabilities of different systems.

The Adaptation Matrix shown in **Appendix E** groups asset areas by issue and identifies available policy, regulatory, and financial tools that can assist with developing policies, programs, and projects that respond to adaptation issues. This matrix is to be used over time as a guide for developing and implementing policies, programs, and projects to address anticipated changes resulting from changes in sea level and storm events.

To implement adaptation strategies, the County will prepare, monitor, and implement a work program that results in the creation of policies, programs, and regulations as well as the installation of capital improvements and educational programs. As the first adaptation strategy for the County, the intention is to provide an adaptation policy framework and a set of operational changes and actions to increase adaptive capacity in response to vulnerabilities, available resources, and political priorities. These strategies are listed later in this chapter, and are given more detail in terms of implementation in **Appendix E**, although **Appendix E** should be considered a working document. The following principles should be used to develop the implementation strategy.

- a) Prioritize policies that can build on existing work rather than policies that require new sources of funding or staffing.
- b) Develop policies that are flexible enough to incorporate new science or improved modeling, but well defined enough to be implementable.
- c) Consider strategies to adapt to both short- and long-term impacts from climate change.

San Mateo County plans, programs, and departments that are currently available to support an adaptation strategy include the following:

- County General Plan
- Planning and Building regulations and requirements
- Local Hazard Mitigation Plan
- Urban Water Management Plan
- Public Health/Environmental Health
- Office of Emergency Services

In addition to County policies and programs, the State implements plans and programs and has agencies with the potential to support an adaptation strategy, including:

- San Francisco Bay Plan
- Local Coastal Program

- California Department of Transportation (Caltrans) programs
- Bay Area Air Quality Management District
- Regional Water Quality Control Board

Federal programs and agencies include:

- Federal Insurance Rate Maps
- Funding distributed through the regional Metropolitan Transportation Commission (MTC)
- National Oceanic and Atmospheric Administration
- US Army Corps of Engineers

The adaptation strategies and actions on the following pages are similar to those presented in the Adaptation Matrix in **Appendix E**. However, **Appendix E** provides additional detail on categories such as lead agency as well as additional potential implementation details. As such, **Appendix E** is considered a working document.

Ongoing Supportive Actions

- Identify funding needs and potential sources of funding to implement climate adaptation programs and policies.
- Implement cost-effective policies and programs to mitigate greenhouse gas emissions and reduce the magnitude of climate change impacts.
- Monitor policy and scientific information related to climate change and update policies and programs to reflect available data.
- Identify potential barriers to climate change adaptation including funding, uncertainty, and the cooperation and coordination of agencies.
- Engage the public in evaluating potential responses for adapting to climate impacts and risks.
- Develop education and communication plans in multiple languages to inform residents about heat-related health risks.

Priority Operational Actions

- Incorporate potential climate change impacts into the decision-making process when siting new facilities and prioritizing repairs and improvements to critical infrastructure.
- Adopt local guidelines that include the potential impacts from climate change among the issues to be considered when preparing environmental documents in accordance with the California Environmental Quality Act (CEQA).
- Coordinate an integrated update to the County's Local Hazard Mitigation Plan and other relevant plans to analyze the potential effects of climate change, and develop policies, programs, and strategies to minimize risks to life, property, and natural systems.
- Prepare and implement a program to educate unincorporated county residents and businesses about potential climate change risks, and identify the key steps individuals can undertake to prepare for potential climate change risks.
- Work with FEMA to revise flood hazard maps, and coordinate with state and federal agencies to identify areas that will be subject to inundation as the result of changes in sea level or storm events. Develop a strategy for minimizing damage to structures and facilities that are at risk, including adaptive design, relocation, and protection, and update codes, requirements, and procedures to implement these strategies.
- Develop resource management plans to address anticipated changes in sea level and extreme events on critical habitats or species and on public beaches, wetlands, tidal pools, and similar shoreline resources.
- Develop water management plans that evaluate conservation, recycling, and expanded storage capacity.
- Address reoccurring risks through continued research, updates to local plans and policies, and additional preparation and coordination (rebuilding in floodplains, coastal bluff erosion, air quality impacts to sensitive receptors, transitioning economies, etc.).
- Participate in regional efforts to protect existing transportation facilities, including highways and airports, while addressing changes in sea level and extreme events.
- Coordinate with regional agencies and strategic partners to:
 - Develop disaster restoration plans to address cleanup and debris management and to facilitate recovery from fire, flood, and storm events.

- Create a regional sediment management plan to protect natural resources (for example, beaches and wetlands).
- Develop resource management plans to address anticipated changes in sea level and extreme events on public beaches, wetlands, tidal pools, and similar shoreline resources.
- Protect existing transportation facilities, including highways and airports, while addressing changes in sea level and extreme events.
- Ensure health care facilities have the capacity to address increased demand during heat events.

Priority Adaptive Capacity Actions

- Amend the General Plan to include policies that support adaptation strategies by:
 - Establishing the Energy Efficiency Climate Action Plan as the implementation tool for addressing issues resulting from climate change supporting policies, programs, and projects to address identified vulnerabilities.
 - Including changes in sea level, temperature, and weather events as factors to consider when designing, evaluating, and implementing policies, programs, and projects.
 - Identifying biological/natural solutions as the preferred strategy for shoreline protection rather than “armoring” (e.g., sea walls, breakwaters).
 - Establishing mechanisms to assess risk and liability for projects and activities that may occur in areas vulnerable to climate change.
- Prepare and update public service and infrastructure improvement and management plans to address anticipated climate changes.
 - Emergency Operations: Update the County's Emergency Operations Plan, Local Hazard Mitigation Plan, and other relevant plans to analyze the potential effects of climate change and develop policies, programs, and strategies to minimize risks to life, property, and natural systems, including landslide hazards and vulnerability from extreme events such as flooding, fire, and storm events. The plan should include provisions for:
 - Fire-resistant development in the urban/wildland interface areas.
 - Restoration and recovery plans to facilitate recovery from fire, flood, and storm events and address cleanup and debris management.

- Protecting fire suppression facilities from anticipated vulnerabilities and ensuring water supplies are adequate to respond to anticipated needs.
- Establishing adequate fire breaks and vegetative clearance around structures, roadways, and in wildland areas.
- Public Health: Prepare an inventory of essential public health infrastructure (emergency facilities, emergency response routes, water supplies, wastewater disposal, etc.) and recommend necessary improvements to ensure the County's ability to respond adequately to increased medical needs that may result from higher temperatures, more extreme storm events, flooding, and fire.
- Identify opportunities to provide shade shelters and cooling stations in strategic locations such as County-owned facilities that are accessible to the public to prepare for more frequent extreme heat events.
- Infrastructure: Public facility plans (e.g., roads, water, and sewer) should be updated to include an inventory of existing facilities, identify areas of vulnerability, and make recommendations about upgrading, relocating, and/or replacing facilities that are exposed to changes in sea level, extreme events, and other effects of climate change.
- Inventory and assess the integrity of vital public utility systems to ensure their ability to withstand the effects of climate change such as inundation in the shoreline band and coastal zone.
- Coordinate with water and sewer districts to inventory existing water and wastewater facilities and identify areas of vulnerability. Recommend upgrades, relocation, and/or replacement of facilities that are vulnerable to changes in sea level, extreme events, and other effects of climate change as appropriate.
- Water/Groundwater: Develop a water management strategy and coordinated groundwater management plan that considers conservation, recycling, and increased storage capacity to support local agricultural operations while not adversely impacting aquatic species.
- Agriculture/Forestry: Prepare and implement a long-term forest and vegetation management plan that accounts for prolonged periods of dry weather, increased fire risk, and other anticipated effects of climate change as well as allows for sustainable harvests. The plans would ensure adequate fire breaks and vegetative clearance around structures, roadways, and in wild land areas.
- Built Environment:
 - Establish the State of California Sea-Level Rise Interim Guidance Document as the standard (sea level rise of 40 inches) for designing, evaluating, and implementing plans projects and programs.

- Establish criteria and standards to encourage retrofitting, relocating, or limiting planned and existing development in areas that are subject to changes in sea level, high fire risk, and/or increased erosion as the result of changes in the climate.
- Install low-impact development, natural filtration, and urban runoff catchments to address changes in the precipitation pattern, flooding, and other extreme events as well as increase groundwater recharge.
- Encourage preservation and habitat enhancement in undeveloped areas that are both vulnerable to future flooding and currently sustain critical habitats or species or possess conditions that make the area especially suitable for ecosystem enhancement and discourage development in these areas.
- Protect recreational facilities that might be vulnerable to inundation as the result of climate changes.

IMPLEMENTATION

Reducing greenhouse gas (GHG) emissions 17% below baseline levels by 2020 is a major task. This chapter outlines a path for the County to monitor progress and summarizes the GHG reductions that will occur through the implementation of this Energy Efficiency Climate Action Plan (EECAP; Plan).



IMPLEMENTATION POLICIES

To ensure the success of this EECAP, the County will integrate the goals and strategies of this Plan into other local and regional plans, programs, and activities. As the County moves forward with Zoning Code updates, Specific Plans, Housing Element updates, and other planning documents, staff will ensure that these documents support and are consistent with the EECAP.

EECAP implementation will require County leadership to execute these measures and report on the progress of their implementation. This Plan identifies the responsible department for each measure and offers time frames and cost estimates for implementing each strategy. Successful implementation requires regular reporting. Staff will monitor the EECAP's implementation progress on an annual basis and report to the Board of Supervisors on the progress made. Development of an implementation and monitoring tool will assist in tracking progress. The following policies are presented to ensure the County is successful in the implementation of the EECAP.

IMPLEMENTATION MEASURE 1: MONITORING

Monitor and report the County's progress toward achieving the reduction target.

Action Items:

- Prepare a progress report once every two years for review and consideration by the Board of Supervisors.

- Utilize the monitoring and reporting tool to assist with bi-annual reports.
- Identify key staff responsible for bi-annual reporting and monitoring.

IMPLEMENTATION MEASURE 2: UPDATE GHG INVENTORY AND PLAN

Update the baseline greenhouse gas emissions inventory and EECAP every five years, at a minimum.

Action Items:

- Inventory 2010 GHG emissions no later than 2017.
- Update the EECAP no later than 2017 to incorporate new technology, programs, and policies to reduce GHG emissions.
- Consider updating and amending the EECAP, as necessary, should the County find that specific reduction measures are not meeting intended GHG reductions.

IMPLEMENTATION MEASURE 3: COLLABORATIVE PARTNERSHIPS

Continue to develop partnerships that support implementation of the EECAP.

Action Items:

- Continue formal memberships and participation in local and regional organizations that provide tools and support for energy efficiency, energy conservation, greenhouse gas emissions reductions, adaptation, education, and implementation of this Plan, such as C/CAG, the Regionally Integrated Climate Action Planning Suite (RICAPS) process, and the San Mateo County Energy Watch.
- Work closely with nongovernmental agencies and local community groups for ongoing implementation and deployment of the programs and efforts described in this Plan, including partners such as the Sierra Club, the Committee for Green Foothills, the San Mateo County Energy Watch, the Peninsula Open Space Trust, the Half Moon Bay Chamber of Commerce, university partners, the UC Cooperative Extension, environmental organizations, community foundations, nonprofit organizations, schools, local businesses, and labor advocacy organizations.
- Continue partnerships with water, waste, and other service providers to monitor opportunities for supporting the objectives and programs outlined in this Plan.

IMPLEMENTATION MEASURE 4: FUNDING SOURCES

Secure necessary funding to implement the EECAP.

Action Items:

- Identify funding sources for reduction measures as part of bi-annual reporting.
- Ensure implementation through the inclusion of emissions reduction and adaptation measures in long-term and programmatic budgets, the capital improvement program, and other plans as appropriate.
- Pursue local, regional, state, and federal grants as appropriate to support implementation.

IMPLEMENTATION MATRIX

The matrix in **Table 8** contains the GHG reduction, performance target, implementation time frame, and responsible and supporting agencies information presented in **Chapter 4** for the year 2020, as well as more detail for County staff to effectively integrate these actions into budgets, the capital improvement program, and other programs and projects.

Table 8. Implementation Matrix

| # | Reduction Measure | GHG Reduction (MTCO ₂ e/year) | | Performance Targets | | Community | | Responsible Agencies & Partners | Applicability | |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-----------|---------|--------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| 1.1 | Promote voluntary energy efficiency improvements through rebate programs, such as the Energy Upgrade California program, and other similar programs as they become available. | 2,910 | 6,300 | Participation of 36% of households (8,235) in the program | Participation of 82% of households (19,464) in the program | H | H | Housing, County Manager | EX | V |
| 1.2 | Research and promote innovative financing opportunities for residential energy efficiency upgrades to achieve 30% average household energy savings. | 810 | 1,910 | Participation of 3% of households (690), each achieving 30% in energy savings | Participation of 7% of households (1,670), each achieving 30% in energy savings | H | MH | Planning & Building, Housing | EX | V |
| 1.3 | Perform outreach to eligible low-income residents to encourage participation in federally funded | 1,460 | 1,470 | Participation of 1,632 eligible households | Participation of 1,691 eligible households | L | H | Housing, Planning & Building, El Concilio of San | EX | V |

Costs & Savings abbreviations. L: Low (Less than \$25,000); LM: Low-Mid (\$25,001-\$100,000); M: Medium (\$100,001-\$200,000); MH: Medium-High (\$200,001 - \$500,000); H: High (Over \$500,000)

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| # | Reduction Measure | GHG Reduction (MTCO ₂ e/year) | | Performance Targets | | Community | | Responsible Agencies & Partners | Applicability | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|-----------------------------------------------|-----------------------------------------------|-----------|---------|------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | weatherization programs. | | | (25%) | (25%) | | | Mateo County | | |
| 1.4 | Incentivize or encourage appropriate tree planting near buildings to reduce heat gain and loss and to sequester greenhouse gases. | 450 | 910 | Participation of 2,300 homes (10%) in project | Participation of 4,770 homes (20%) in project | H | MH | Planning & Building, Public Works, Parks | EX | V |
| 1.5 | Incentivize or encourage residents to switch from propane heaters to more energy efficient options, such as Energy Star furnaces or electric air-source heat pumps (ASHPs). | Supportive Measure | | | | | | Planning & Building | EX | V |
| 2.1 | Promote and potentially further incentivize third-party programs for commercial and industrial energy efficiency, such as the Commercial Industrial | 2,800 | 4,610 | Participation of 788 businesses | Participation of 2,167 businesses | H | H | C/CAG, PG&E | EX | V |

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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------|---------|-------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | Boiler Efficiency Program. | | | | | | | | | |
| 2.2 | Research and promote innovative financing opportunities for commercial energy efficiency upgrades. | 1,710 | 4,590 | Participation of 93 businesses | Participation of 253 businesses | H | H | Planning & Building with other departments to be determined | EX | V |
| 2.3 | Facilitate energy efficiency in large institutional energy users, including golf courses, airports, and schools. | 11,070 | 34,290 | Participation of 10 large institutional businesses such as golf courses or country clubs | Participation of 20 large institutional businesses such as golf courses or country clubs | H | H | Planning & Building with other departments to be determined | EX | V |
| 2.4 | Participate in the County Green Business Program to encourage sustainability and energy efficiency in businesses throughout the unincorporated county. | Supportive Measure | | | | | | Public Works, Planning | EX | V |
| 2.5 | Support energy | Supportive Measure | | | | | | Public Works, | New & | V |

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|-----|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|-----------------------------------------------------------|-----------------------------------------------------------|-----------|---------|---------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | benchmarking of the nonresidential sector to help business owners identify opportunities for energy improvements. | | | | | | | Planning & Building | EX | |
| 3.1 | Strengthen the energy efficiency requirements of the existing Green Building Ordinance, with appropriate outreach to stakeholders. | 310 | 800 | Participation of 2% of new homes and 5% of new businesses | Participation of 3% of new homes and 9% of new businesses | L | H | Planning & Building | New & EX | MN |
| 3.2 | Provide additional incentives to promote voluntary green building practices. | 6,460 | 68,440 | Participation of new 550 households and 75 new businesses | Participation of 5,550 households and 832 businesses | LM | MH | Planning & Building, Housing | New & EX | V |
| 3.3 | Require tree planting, shading design, solar orientation, and “cool” hardscapes. | <20 | 20 | Participation of 145 households and 15 | Participation of 1,231 households and 121 | L | L | Planning & Building, Housing | New & EX | MN |

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|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|--------------------------------------------------------|--------------------------------------------------------|-----------|---------|---------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | | | | businesses | businesses | | | | | |
| 3.4 | Expedite the review, permitting, and inspection process for projects targeting higher levels of energy reduction than mandated target goals or incorporating renewable energy systems. | Supportive Measure | | | | | | Planning & Building | New & EX | V |
| 3.5 | Promote green building practices and develop community-wide capacity for energy efficiency in new construction. | Supportive Measure | | | | | | Planning & Building, Public Works, Public Library | New & EX | V |
| 3.6 | Develop programs and incentives to promote large-scale community-wide partnerships for energy efficiency. | 10 | 10 | Participation of 5% of households and 1% of businesses | Participation of 8% of households and 3% of businesses | L | L | Planning & Building, Housing, Public Works | New & EX | V |
| 4.1 | Provide incentives for small- | 100 | 410 | Installation of | Installation of | LM | M | Planning & | New & | V |

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|-----|--------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|-------------------------------------------------------------------------|---------------------------------------------------------------------------|-----------|---------|--------------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | scale solar PV systems less than 10 kW in size to encourage solar PV energy installations on existing development. | | | 73 residential PV systems and 18 commercial PV systems | 345 residential PV systems and 86 commercial PV systems | | | Building, Public Works, Tax Collector/ Treasurer/ Revenue Services | EX | |
| 4.2 | Provide incentives for solar water heaters and reduce/remove permit fees for solar hot water energy installations. | 100 | 470 | Installation of 27 residential SHW systems and 9 commercial SHW systems | Installation of 130 residential SHW systems and 43 commercial SHW systems | H | M | Planning & Building, Housing | New & EX | V |
| 4.3 | Require all new roofs to be pre-wired for solar PV and all new buildings to be plumbed for solar water heaters. | Supportive Measure | | | | | | Planning & Building, Housing | New | MN |
| 4.4 | Encourage developers to offer solar PV and solar | 70 | 530 | Participation of 50 | Participation of 442 | H | LM | Planning & Building, | New | V |

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|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|----------------------------------------------------------------|------------------------------------------------------------------|-----------|---------|--------------------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | water heaters as a standard feature on a percentage of new homes in a development and as an upgrade for redevelopment projects in residential and commercial projects. | | | households with 5 kW systems | households with 5 kW systems | | | Housing in partnership with Joint Venture Silicon Valley | | |
| 4.5 | Encourage the adoption of new, innovative financing options for renewable installations. | 3,100 | 10,810 | Participation of 3,450 households and 93 businesses in program | Participation of 13,107 households and 397 businesses in program | H | H | Tax Collector/ Treasurer/ Revenue Services, Planning & Building | New & EX | V |
| 4.6 | Encourage the development of commercial wind farms. | Supportive Measure | | | | | | Planning & Building | Other | V |
| 4.7 | Incentivize safe and effective small distributed generation wind power systems on existing development in locations that complement | 430 | 680 | Participation of 143 households and 62 businesses | Participation of 247 households and 108 businesses | MH | M | Planning & Building | New & EX | V |

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|----------------------------------------------------------|-----------------------------------------------------------|-----------|---------|-----------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | existing land uses. | | | | | | | | | |
| 4.8 | Investigate Community Choice Aggregation (CCA) to allow residents and businesses in the unincorporated county to aggregate their buying power to purchase renewable energy. | Supportive Measure | | | | | | Public Works, Housing | New & EX | V |
| 4.9 | Allow new development projects to participate in energy offset programs to purchase electricity generated from renewable sources off site. | 2,630 | 22,380 | Participation of 13 households | Participation of 109 households | L | L | Planning & Building, Public Works | New | V |
| 4.10 | Incentivize or encourage the use of green waste and food waste for alternative energy generation. | 50 | 140 | Divert 4,250 tons of food and green waste into WTE plant | Divert 11,980 tons of food and green waste into WTE plant | H | M | Public Works | Other | V |

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|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|----------------------------------------------------------------------------------|------|-----------|---------|---------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| 5.1 | Update the General Plan and Zoning Ordinance to encourage transit-oriented, mixed-use developments at appropriate locations. | 420 | 380 | Density of 9 housing units per acre and 45 intersections per square mile | | L | ML | Planning & Building | New | MN |
| 5.2 | Create an impact fee program for new projects to encourage development in locations with high accessibility to destinations such as jobs, retail, and other attractions. The impact fee program will also be used to fund public transit improvements or school bus programs (as discussed in Measures 6.3 and 6.4). | Supportive Measure | | | | | | Planning & Building | New | MN |
| 5.3 | As appropriate, require new projects in North Fair Oaks, urban communities, and | 250 | 230 | Improvement in pedestrian connectivity as indicated by increased density from an | | M | L | Planning & Building, Public | New | MN |

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|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------|------|-----------|---------|-----------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | business districts to include improved design elements to enhance walkability and connectivity while balancing impacts on vehicle congestion. | | | estimated 5 units per acre to 9 units per acre | | | | Works | | |
| 6.1 | When updating the General Plan, look for opportunities to add neighborhood-serving retail at key locations throughout the unincorporated county. | 990 | 900 | All development: 90% residential with 10% commercial | | MH | L | Planning & Building | New | V |
| 6.2 | Require larger new projects (including existing projects with major renovations) to evaluate and implement appropriate traffic calming measures at the site, as determined through the plan review process. | 180 | 150 | 7–10% of unincorporated county roads and intersections have new traffic calming devices implemented at roadway segments or intersections | | M | M | Planning & Building, Public Works | New | MN |

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|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------|---------|-------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| 6.3 | Use the impact fee program discussed in Measure 5.2 to fund transit improvements, optimization, and expansion in the unincorporated county. | Supportive Measure | | | | | | Planning & Building, Public Works | Other | 0 |
| 6.4 | Work with SamTrans to optimize the local transit network by adding or modifying existing transit service to enhance the service near future project sites and areas of future demand in the unincorporated county. | 350 | 300 | Transit mode share of 4–5%, expansion of miles covered by the transit network by 2.5%, 13% increase in transit frequency (headways) | | L | L | Planning & Building working with SamTrans | Other | 0 |
| 7.1 | Amend the Zoning Ordinance to allow a reduction in parking requirements if deemed appropriate, and establish parking maximums, | 1,170 | 1,050 | 10% reduction in parking supply | 10% reduction in parking supply | MH | M | Planning & Building | New | MN |

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|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------------------------------------------------------------|---------------------------------------------------------------------|-----------|---------|-------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | standards that will limit the number of parking spots in new projects and allow for flexible parking reductions to discourage an over-reliance on auto travel. | | | | | | | | | |
| 7.2 | Evaluate the existing parking standards and look for ways to increase efficiency. | Supportive Measure | | | | | | Public Works, Planning and Building | Other | 0 |
| 7.3 | Work with stakeholders to unbundle parking costs from property costs at strategic locations in the unincorporated county, including North Fair Oaks, the Middlefield Road area, the small business district in West Menlo Park, and areas in Emerald Lakes Hills. Unbundling separates | 2,320 | 2,100 | \$2.50 recommended/TBD per day parking charge in business districts | \$2.50 recommended/TBD per day parking charge in business districts | L | M | Public Works, Planning & Building | Other | 0 |

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|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------|---------------------------------------------------------------------------------------------------------|------|-----------|---------|----------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | parking from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost from the property cost. This removes the burden from those who do not wish to utilize a parking space. | | | | | | | | | |
| 8.1 | Require all large employers to implement a Commute Trip Reduction (CTR) program to discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as walking, biking, transit riding, carpooling, vanpooling, and ridesharing. | 1,240 | 1,130 | 10–25% of employers to charge \$3 per day for parking, 25–50% of employers subsidizing employee transit | | H | L | Planning & Building, C/CAG, Traffic Congestion Relief Alliance | New & EX | MN |
| 8.2 | Implement workplace parking pricing at | Supportive Measure | | | | | | Planning & Building, C/CAG | New & EX | MN |

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|-----|---------------------------------------------------------------------------------------------------------|------------------------------------------|------|----------------------------------------------------------------------------------------------------|------|-----------|---------|-------------------------------------------------------------------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | employment centers. | | | | | | | | | |
| 8.3 | Require employers to provide a subsidized/discounted daily or monthly public transit pass to employees. | | | Supportive Measure | | | | Planning & Building, C/CAG | New & EX | MN |
| 8.4 | Promote expansions of worker shuttle programs. | 160 | 140 | Participation of 50% of employees in 5–20% of employers participate in a shuttle program | | MH | L | Planning & Building, Public Works, C/CAG, Traffic Congestion Relief Alliance, San Mateo County Transportation Authority | New & EX | V |
| 9.1 | Promote school shuttle programs to reduce vehicle miles traveled (VMT). | 20 | 20 | School bus route restoration/increase by 25–75% of schools with 25–50% of students riding, and 25– | | L | L | Health, Public Works, in partnership with San Mateo | Other | V |

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|------|------------------------------------------------------------|------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------|---------|-----------------------------------------------------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | | | | 75% of students participating in a school pool ridesharing program | | | | County Office of Education, Traffic Congestion Relief Alliance, San Mateo County Transportation Authority | | |
| 10.1 | Increase alternative fuel infrastructure in the community. | 1,780 | 2,200 | The use of 100 NEVs, installation of 200 EV charging stations, and 20% of households participating in a rideshare program | The use of 300 NEVs, installation of 500 EV charging stations, and 40% of households participating in a rideshare program | MH | L | Planning & Building, Public Works | New & EX | V |
| 10.2 | Educate the public on the | Supportive Measure | | | | | | Planning & | Other | V |

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|------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|------------------------------|------|-----------|---------|-----------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | feasibility, availability, and incentives for alternatively fueled vehicles. | | | | | | | Building, Public Library | | |
| 11.1 | Conduct a public outreach campaign to educate farmers and growers of easy and low- to no-cost energy efficiency practices. | | | Supportive Measure | | | | Planning & Building, Agriculture/Weights & Measures | Other | V |
| 11.2 | Create resources to promote best practices for agricultural management to establish a list of best practices for agricultural management. | | | Supportive Measure | | | | Planning & Building, Agriculture/Weights & Measures | Other | V |
| 12.1 | Streamline regulations for the farming community to support sustainable practices and GHG reductions. | | | Supportive Measure | | | | Planning & Building, Agriculture/Weights & Measures | Other | V |
| 13.1 | Require new development | Supportive | | Achieve an 8–10% decrease in | | MH | L | Public Works, | NEW | MN |

Costs & Savings abbreviations. L: Low (Less than \$25,000); LM: Low-Mid (\$25,001-\$100,000); M: Medium (\$100,001-\$200,000); MH: Medium-High (\$200,001 - \$500,000); H: High (Over \$500,000)

Sector abbreviations. EX: Existing Development; New: New Development; Other: Not development-specific.

Mandatory or Voluntary abbreviations. MN: Mandatory; V: Voluntary; Other: other work efforts not necessarily tied to development applicability.

| # | Reduction Measure | GHG Reduction (MTCO _{2e} /year) | | Performance Targets | | Community | | Responsible Agencies & Partners | Applicability | |
|------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|---------------------------------------------------------------------------------------------|------|-----------|---------|-----------------------------------|---------------|----------------------------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | to incorporate a minimum of 15% of recycled materials into construction to encourage the market for recycled goods. | Measure | | waste associated with construction materials | | | | Planning & Building | | |
| 13.2 | Work toward zero waste through comprehensive recycling and composting programs, in addition to aggressive outreach efforts. | 14,900 | 21,960 | Achieve a 4 pounds/person/day waste disposal rate, including a 25% diversion of food waste. | | MH | L | Public Works, Planning & Building | New | MN |
| 13.3 | Investigate the creation of an agricultural and food waste-to-energy (WTE) biomass facility in San Mateo County. | Supportive Measure | | | | | | Planning & Building, Public Works | New & EX | MN for New, V for Existing |
| 13.4 | Continue to monitor and promote emerging technologies to increase landfill gas capture and combustion efficiency and | Supportive Measure | | | | | | Planning & Building, Public Works | Other | V |

Costs & Savings abbreviations. L: Low (Less than \$25,000); LM: Low-Mid (\$25,001-\$100,000); M: Medium (\$100,001-\$200,000); MH: Medium-High (\$200,001 - \$500,000); H: High (Over \$500,000)

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| # | Reduction Measure | GHG Reduction (MTCO ₂ e/year) | | Performance Targets | | Community | | Responsible Agencies & Partners | Applicability | |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|---------------------------------------------------------------------|---------------------------------------------------------------------|-----------|---------|---------------------------------------------------------|---------------|----------------------------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | to reduce fugitive emissions in each process. | | | | | | | | | |
| 14.1 | Work with water companies that serve the community to install smart water meters on 50% of residential and commercial customers by 2015 and 95% by 2020. | 140 | 140 | Installation of smart water meters for 95% of customers by 2020 | | M | L | Planning & Building, Public Works | New & EX | V |
| 14.2 | Increase the use of grey, rain, and recycled water for landscaping and agricultural purposes throughout the community to reduce the use of potable water. | 30 | 60 | Household participation rate of 25% | Household participation rate of 50% | M | ML | Planning & Building, Public Works, Environmental Health | New & EX | MN for New, V for Existing |
| 15.1 | Adopt ordinances and policies that aim to reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, | 7,290 | 14,040 | 40% of construction equipment is efficient or alternatively fueled; | 65% of construction equipment is efficient or alternatively fueled; | MH | M | Planning & Building, Public Works | New | MN |

Costs & Savings abbreviations. L: Low (Less than \$25,000); LM: Low-Mid (\$25,001-\$100,000); M: Medium (\$100,001-\$200,000); MH: Medium-High (\$200,001 - \$500,000); H: High (Over \$500,000)

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| # | Reduction Measure | GHG Reduction (MTCO ₂ e/year) | | Performance Targets | | Community | | Responsible Agencies & Partners | Applicability | |
|------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------|---------------------------------------------------|----------------------------------------------------|-----------|---------|--------------------------------------------------------------------------------------|---------------|---------|
| | | 2020 | 2035 | 2020 | 2035 | Costs | Savings | | Sector | MN or V |
| | and vehicles to exceed the Bay Area Air Quality Management District’s (BAAQMD) requirements. | | | local idling restrictions are met 50% of the time | local idling restrictions are met 2/3 of the time | | | | | |
| 15.2 | Facilitate the conversion of outdoor household equipment to more efficient models. | 140 | 140 | 650 leaf blowers and 2,200 lawn mowers exchanged | 2,200 leaf blowers and 4,970 lawn mowers exchanged | L | L | Planning & Building, Housing, in partnership with other departments to be determined | New & EX | V |
| 16.1 | Identify opportunities for forestry sequestration on County lands, including but not limited to publicly owned forests. | Supportive Measure | | | | L | L | Parks Department | Other | V |

Costs & Savings abbreviations. L: Low (Less than \$25,000); LM: Low-Mid (\$25,001-\$100,000); M: Medium (\$100,001-\$200,000); MH: Medium-High (\$200,001 - \$500,000); H: High (Over \$500,000)

Sector abbreviations. EX: Existing Development; New: New Development; Other: Not development-specific.

Mandatory or Voluntary abbreviations. MN: Mandatory; V: Voluntary; Other: other work efforts not necessarily tied to development applicability.

MONITORING AND UPDATING THIS PLAN

The County will use the implementation matrix, as well as the implementation and monitoring tool, to track, monitor, and update the Energy Efficiency Climate Action Plan. As the County reports on progress in implementing the EECAP, staff will evaluate the effectiveness of each measure to ensure that the anticipated GHG reductions are occurring. In the event that GHG reductions do not occur as expected, the County will be able to modify and add further policies to the EECAP to ensure the County meets the local reduction target.

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APPENDIX A: GLOSSARY



Air Basin: A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined by the California Air Resources Board (CARB) along political boundary lines and include both the source and receptor areas. California is currently divided into 15 air basins. San Mateo County is in the San Francisco Bay Area Air Basin.

Air Pollutants: Amounts of foreign and/or natural substances occurring in the atmosphere that may result in adverse effects to humans, animals, vegetation, and/or materials.

American Recovery and Reinvestment Act (ARRA): Commonly referred to as the Stimulus Plan or Recovery Act, ARRA is an economic stimulus package enacted by the federal government in 2009. The intent of the stimulus is to create jobs and promote investment and consumer spending during the economic recession.

Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006: Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases (GHG) for the State of California. AB 32 designates the California Air Resources Board (CARB) as the responsible agency for monitoring and reducing statewide GHG emissions to reduce emissions to 1990 levels by 2020.

Assembly Bill (AB) 811: Authorizes all cities and counties in California to designate areas within which willing property owners may finance the installation of distributed renewable energy generation, as well as energy efficiency improvements, through low-interest loans. These financing programs are commonly referred to as Property Assessed Clean Energy, or PACE, programs.

Assembly Bill (AB) 939: Establishes a goal of achieving a statewide waste diversion rate of 50% and requires cities and counties to divert a minimum of 50% of their waste stream for reuse or recycling.

Assembly Bill (AB) 1881: Requires local agencies to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

Association of Bay Area Governments (ABAG): The regional planning agency for the 9 counties and 101 incorporated cities in the San Francisco Bay Area.

Buildout; Build-out: Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning designations.

Business-as-Usual (BAU): A business-as-usual projection forecasts greenhouse gas emissions without regulatory or technical intervention to reduce GHG emissions.

California Air Resources Board (CARB): A division of the California Environmental Protection Agency charged with protecting public health, welfare, and ecological resources through the reduction of air pollutants.

California Climate Adaptation Strategy (CAS): Summarizes the best-known science on climate change impacts to California and provides recommendations on how to manage the risks.

California Environmental Quality Act (CEQA): A state law requiring state and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an environmental impact report (EIR) must be prepared and certified as to its adequacy before action can be taken on the proposed project. General plans require the preparation of a program EIR.

California Green Building Standards Code (CALGreen): The 2010 California Green Building Standards Code, commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics.

California Solar Initiative (CSI): Allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities: Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE).

Carbon Dioxide (CO₂): A colorless, odorless gas that occurs naturally in the earth's atmosphere. Significant quantities are also emitted into the air by fossil fuel combustion.

Carbon Dioxide Equivalent (CO₂e): A metric measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

Carbon Sequestration: The process through which agricultural and forestry practices remove carbon dioxide (CO₂) from the atmosphere. The term "carbon sinks" is also used to describe agricultural and forestry lands that absorb CO₂.

Car Sharing: A type of car rental where people rent cars for short periods of time, often by the hour.

Clean Air Act: Requires the US Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards for six common air pollutants, known as "criteria pollutants," that are found all over the United States: particle pollution (particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. The EPA regulates the pollutants by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels.

Clean Car Fuel Standards (AB 1493, Pavley): Signed into law in 2002 and commonly referred to as Pavley standards. Requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

Climate Action Plan (CAP): Strategic plans that establish policies and programs for reducing (or mitigating) a community's GHG emissions and adapting to the impacts of climate change.

Climate Change (also referred to as global climate change): The term "climate change" is sometimes used to refer to all forms of climatic inconsistency, but because the earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term "global warming"; scientists, however, tend to use the term in the wider sense to also include natural changes in climate.

Climate Change Adaptation: The adjustment in natural or human systems to respond to actual or expected climate changes to minimize harm or take advantage of beneficial opportunities.

Climate Change Mitigation: A technical or behavioral intervention to reduce the sources of greenhouse gas emissions in order to reduce the potential effects of climate change.

Climate Zone: The California Energy Commission (CEC) has classified the distinct climates throughout California by climate zone to recognize the variability in energy use based on local weather patterns. The CEC

uses these climate zones to determine energy budgets for new and renovated buildings and prescriptive packages for each climate zone to ensure that they meet the State's Title 24 energy efficiency standards.

Co-Benefits: An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing greenhouse gas emissions.

Complete Streets: Complete Streets policies ensure that transportation planners and engineers consistently design and operate the entire roadway with all potential users in mind. This includes private vehicles, bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities. In 2007, the State of California adopted AB 1358, which directs the legislative body of a city or county, upon revision of the circulation element of its general plan, to identify how the jurisdiction will provide for the routine accommodation of all users.

Compressed Natural Gas (CNG): A fossil fuel substitute for gasoline, diesel, or propane that can be used in passenger and heavy-duty vehicles.

Conservation: Planned management of a natural resource to prevent exploitation, destruction, or neglect.

Construction and Demolition Waste (C&D): C&D materials consist of the waste generated during the construction, demolition, or renovation of buildings, roads, and other construction projects. C&D materials may include heavy, bulky materials such as concrete, glass, wood, and metal, among other materials.

Distributed Energy Resources (DER): Small, modular, energy generation and storage technologies that provide electric capacity or energy located where it's needed. DERs typically produce less than 10 megawatts (MW) of power and include wind turbines, photovoltaic (PV), fuel cells, micro turbines, reciprocating engines, combustion turbines, cogeneration, and energy storage systems. DER systems may be either connected to the local electric power grid or isolated from the grid in stand-alone applications.

Emission Standard: The maximum amount of pollutant legally permitted to be discharged from a single source, either mobile or stationary.

Energy Conservation: Reducing energy waste, such as turning off lights, heating, and motors when not needed.

Energy Efficiency: Doing the same or more work with less energy, such as replacing incandescent light bulbs with compact fluorescent light bulbs or buying an Energy Star appliance to use less energy for the same or greater output.

Energy Efficiency and Conservation Block Grant (EECBG): The EECBG program was funded through the American Recovery and Reinvestment Act and is managed by the US Department of Energy to assist cities, counties, states, and territories to develop, promote, and implement energy efficiency and conservation programs and projects.

Energy Efficiency Standards (Title 24, Part 6): Title 24 standards were first adopted in 1978 and established minimum energy efficiency standards for residential and nonresidential buildings. These standards are updated continually by providing more stringent energy budgets for new buildings in an effort to reduce California's energy consumption.

Energy Star: A joint program of the US Environmental Protection Agency and the US Department of Energy to provide consumers with information and incentives to purchase the most energy efficient products available.

Energy Star Portfolio Manager: An online management tool that allows nonresidential building owners and tenants to track and assess energy and water use over time. Benchmarking energy and water use allows building owners to identify investment priorities, determine underperforming buildings, and verify efficiency improvements.

Environment: In CEQA, "the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, mineral, flora, fauna, noise, and objects of historic or aesthetic significance."

Environmental Impact Report (EIR): A report required by the California Environmental Quality Act (CEQA) that assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action or project. See California Environmental Quality Act (CEQA).

Environmentally Preferable Purchasing (EPP): California law requires state government to practice environmentally preferable purchasing, which is the procurement of goods and services that have a reduced impact on human health and the environment as compared to other goods and services serving the same purpose.

Feasible: Capable of being accomplished in a successful manner within a reasonable time taking into account economic, environmental, social, and technological factors.

Feed-In Tariff (FIT): A market mechanism designed to encourage the installation of renewable energy by setting a fixed rate for excess energy generated through local renewable energy systems and fed back into the grid for distribution and other uses.

Fossil Fuel Facilities: Include, but are not limited to, oil and gas wells, separators, and refineries.

Global Warming Potential (GWP): An index used to translate the level of emissions of various gases into a common measure in order to compare the relative potency of different gases without directly calculating the changes in atmospheric concentrations. Greenhouse gases are expressed in terms of carbon dioxide equivalent. Global warming potentials are expressed in terms relative to carbon dioxide, which has a global warming potential of 1.

Green Building: Sustainable or "green" building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community. See the California Green Building Standards Code for green building regulations in California.

Greenhouse Gas or Greenhouse Gases (GHG): Gases which cause heat to be trapped in the atmosphere, warming the earth. Greenhouse gases are necessary to keep the earth warm, but increasing concentrations of these gases are implicated in global climate change. Greenhouse gases include all of the following: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The majority of greenhouse gases come from natural sources, although human activity is also a major contributor.

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

Green Waste: Refers to lawn, garden, or park plant trimmings and materials and can be used in home composters or picked up curbside by municipal waste haulers.

Greywater: Wastewater collected from showers, bathtubs, bathroom sinks, and clothes washing machines that is reused on site for irrigation purposes.

Indicator: Types of data or information that can be used to determine the progress or success of each reduction measure.

LEED: Leadership in Energy and Environmental Design, a standard established by the US Green Building Council.

Level of Service (LOS) Standard: A standard used by government agencies to measure the quality or effectiveness of a municipal service such as police, fire, or library, or the performance of a facility, such as a street or highway.

Life-Cycle Costing (LCC): The process of evaluating the total overall costs and benefits of buildings or equipment over time, including initial costs of design and construction; operating costs; long-term costs of maintenance, repair, and replacement; and other environmental or social costs over its full life, rather than simply based on purchase cost alone.

Light-Emitting Diode (LED): A lower energy consuming and longer-lasting alternative to incandescent and compact fluorescent light bulbs.

Low Carbon Fuel Standard (S-1-07): An executive order from former Governor Schwarzenegger, the Low Carbon Fuel Standard established the goal of reducing the carbon intensity of transportation fuels in California by 10% by 2020.

Low Impact Development (LID): An innovative stormwater management approach with a basic principle to design the built environment to remain a functioning part of an ecosystem rather than exist apart from it. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

Metropolitan Planning Organization (MPO): A federally funded transportation planning organization comprising representatives from local government agencies and transportation authorities. See Association of Bay Area Governments (ABAG) for more information on the local MPO.

Mixed Use: Properties on which various uses such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with significant functional interrelationships and a coherent physical design. A single site may include contiguous properties.

National Ambient Air Quality Standards: The prescribed level of pollutants in the outside air that cannot be exceeded legally during a specified time in a specified geographical area.

Native Species: A species within its natural range or natural zone of dispersal, i.e., within the range it would or could occupy without direct or indirect introduction and/or care by humans.

Neighborhood Electric Vehicle (NEV): Small, battery-powered, low-speed electric vehicles. NEVs are typically limited to streets with a posted speed limit of 25 mph or less. NEVs are classified by the California Air Resources Board as zero-emissions vehicles, as they do not produce any tailpipe emissions.

Nonattainment: The condition of not achieving a desired or required level of performance. Frequently used in reference to air quality.

Nonrenewable Energy: Energy from sources that use a nonrenewable natural resource such as uranium or fossil fuels such as coal, oil, or natural gas.

Operations and Maintenance (O&M): Refers to the activities related to the routine, preventive, predictive, scheduled, and unscheduled actions aimed at preventing equipment failure or decline with the goal of increasing efficiency, reliability, and safety.

Ordinance: A law or regulation set forth and adopted by a governmental authority, usually a city or county.

Ozone: Produced when gases or vapors created by cars, solvents, factories, and pesticides mix and react in the presence of sunlight. This results in certain health effects such as breathing difficulties, lung damage, coughing, and chest pains.

Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5}): Fine mineral, metal, smoke, soot, and dust particles suspended in the air. In addition to reducing visibility, particulate matter can lodge in the lungs and cause serious, long-term respiratory illness and other health problems. The smaller the size of the particle, the deeper it can penetrate into the lungs and the more difficult it is to expel.

Preservation: To keep safe from injury, harm, or destruction.

Property Assessed Clean Energy (PACE): See Assembly Bill 811.

Recycled Water: Wastewater from tubs, toilets, and sinks inside homes and offices that is cleaned through a treatment process, producing non-potable water that is safe for landscapes, raw vegetable crops, and agricultural crops.

Reduction Measure: A goal, strategy, program, or set of actions that target and reduce a specific source of greenhouse gas emissions.

Regional Transportation Plan (RTP): A long-term blueprint of the region's transportation systems. The RTP is a federally mandated comprehensive long-range regional planning document that identifies the region's transportation needs, sets forth an action plan of projects, determines actions and programs to address the needs and issues, and documents the financial resources needed to implement the RTP.

Renewable Energy: Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.

Renewables Portfolio Standard (RPS): A regulation requiring utility companies in California to increase the production of renewable energy from solar, wind, or biomass, or geothermal sources.

Retrofit Upon Sale: Requirements on real property to replace inefficient water or energy fixtures as a condition of escrow. Retrofit upon sale requirements typically require a certificate or other form of verification from local government agencies to ensure that the fixtures are replaced and meet minimum efficiency requirements.

Safe Routes to School (SR2S or SRTS): A national movement aimed at providing safe environments to encourage walking and bicycling surrounding local schools through engineering, enforcement, education, encouragement, and evaluation. Safe Routes to School programs are typically funded through federal, state, and local grants. SR2S is the California program; SRTS is the national program.

Scopes: Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are defined as follows:

Scope 1 – Direct emissions sources located within San Mateo County, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas. GHG

emissions from off-road agriculture equipment and nitrogen fertilizer application are considered Scope 1 emissions, while methane emissions from livestock are considered Scope 3.

Scope 2 – Indirect emissions that result because of activities in San Mateo County and limited to electricity, district heating, steam, and cooling consumption. Scope 2 emissions sources include purchased electricity used in the unincorporated county and associated with the generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community’s electricity consumption.

Scope 3 – All other indirect emissions that occur as a result of activity in the unincorporated county. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside of San Mateo County.

Senate Bill (SB) X7-7: Passed in 2009, SB X7-7 requires the state to achieve a 20% reduction in per capita water use by 2020. This law also requires local water providers to set an interim 2015 and a final 2020 community-wide target and demonstrate that projected water use is in compliance with that target, otherwise funding will be affected.

Senate Bill (SB) 97: Requires lead agencies to analyze GHG emissions and climate change impacts under CEQA.

Senate Bill (SB) 375: Directs the metropolitan planning organizations in California to create a Sustainable Communities Strategy as part of the Regional Transportation Plan. The SCS will demonstrate how the region will achieve the 2020 and 2035 GHG reduction targets for the region set by CARB.

Senate Bill (SB) 407: Adopted in 2010, SB 407 requires inefficient indoor plumbing fixtures be replaced with more efficient models by 2014. Starting in 2017 for single-family property sales and 2019 for multi-family sales, the seller must disclose inefficient indoor plumbing fixtures at the time of sale.

Senate Bill (SB) 610 (Chaptered at Water Code 10910): Requires proposed projects subject to CEQA to include a water supply assessment that proves that adequate water exists for the project.

Senate Bill (SB) 1016: Adopted in 2008, SB 1016 establishes per capita waste disposal rate requirements and goals for local agencies in California. The requirements are expressed in a pounds per person per day measurement.

Smart Grid: The smart grid delivers electricity from suppliers to consumers using two-way digital communications. The smart grid is envisioned to overlay the ordinary electrical grid with an information and net metering system, which includes smart meters. Smart meters will allow consumers to become more aware of their energy use and in the future will allow smart grid enabled appliances to be pre-programmed to operate at a time when electricity use or costs are lowest.

Sustainability: Community use of natural resources in a way that does not jeopardize the ability of future generations to live and prosper.

Sustainable Communities Strategy (SCS): The land use element of each MPO's Regional Transportation Plan as required by SB 375. The SCS will demonstrate how the region will achieve the 2020 and 2035 VMT and GHG reduction targets for the region set by CARB.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Transit-Oriented Development (TOD): A mixed-use residential or commercial area designed to maximize access to transit options.

Transportation Demand Management (TDM) Plan: A voluntary or mandatory program developed by local agencies, large employers, or high traffic commercial services to limit the amount of congestion and pollution related to transportation demand. TDM plans may include incentives, regulations, and education about transportation alternatives.

Unbundled Parking: A parking strategy in which parking spaces are rented or sold separately, rather than automatically included with the rent or purchase price of a residential or commercial unit.

Urban Heat Island: The term "heat island" describes built-up areas that are hotter than nearby rural areas. On a hot, sunny summer day, roof and pavement surface temperatures can be 50–90°F (27–50°C) hotter than the air, while shaded or moist surfaces remain close to air temperatures. These surface urban heat islands, particularly during the summer, have multiple impacts and contribute to atmospheric urban heat islands. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.

Urban Reserve: An area outside of an urban service area but within an urban growth boundary, in which future development and extension of municipal services are contemplated but not imminent.

Vehicle Miles Traveled (VMT): A key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve regional air quality goals.

Volatile Organic Compounds (VOC): A variety of chemicals with both short- and long-term adverse health effects. VOCs are emitted as gases from a wide array of products such as paints, lacquers, cleaning supplies, markers, and office equipment and furnishings.

Vulnerable Populations: There are three primary segments of vulnerable populations: those at risk to adverse climate change impacts due to exposure, sensitivity, or adaptive capacity.

Exposure: Physical conditions may put particular populations at risk to the impacts of climate change. For instance, populations living in low-lying or coastal areas may be more exposed to flooding events and sea level rise, while those who work outside may suffer from health-related issues due to increased temperatures and decreased air quality.

Sensitivity: Certain populations, including young children and those over the age of 65, are physiologically more sensitive to extreme temperatures and increased instances of air pollution.

Adaptive Capacity: The adaptive capacity of lower-income and institutionalized populations can be limited due to lower access to the resources necessary to prepare for or react to the long-term impacts of climate change and the increased frequency of disasters.

Water Conservation: Reducing water use, such as by turning off taps, shortening shower times, and reducing outdoor irrigation demand.

Water-Efficient Landscape: Native or low-water-using landscapes. Water-efficient landscapes are required by law in all cities and counties in California to conserve water.

Water Use Efficiency: Replacing older technologies and practices in order to accomplish the same results with less water, for example, by replacing toilets with new high efficiency models and by installing “smart controllers” in irrigated areas.

Zero-Emissions Vehicle (ZEV): A vehicle that does not emit any tailpipe emissions from the on-board source of power. Both electric and hydrogen fuel cell vehicles are classified as ZEVs.

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APPENDIX B: BASELINE GHG INVENTORY



This greenhouse gas emissions inventory (Inventory) summarizes the preliminary results of three key milestone tasks of the County's greenhouse gas (GHG) reduction planning process: (1) inventorying baseline GHG emissions, (2) forecasting GHG emissions, and (3) setting GHG emissions reduction target(s). Specifically, this Inventory presents the findings and recommendations of the following:

- 2005 Baseline Community-Wide GHG Inventory;
- 2020 and 2035 Community-Wide GHG Inventory Forecasts; and
- GHG reduction targets.

This Inventory is a revised draft that incorporates new methods for quantifying emissions from propane use in homes and waste disposal. Findings are subject to revisions during Energy Efficiency Climate Action Plan development.

1. BASELINE GREENHOUSE GAS EMISSIONS INVENTORY BACKGROUND

PURPOSE

The Inventory will act as a foundation for the County's Energy Efficiency Climate Action Plan by informing the County and community of the largest sources of GHG emissions, and thus the largest opportunities for reduction. This Inventory focuses on community-wide emissions in the unincorporated county only, as the

County is currently in the process of updating the County operations government GHG emissions inventory. The purpose of a GHG emissions inventory is to present the major sources and quantities of GHG emissions caused by activities within the unincorporated boundary of San Mateo County. The Inventory will provide a baseline against which future progress can be measured and will serve as the foundation for the County's Energy Efficiency Climate Action Plan.

Specifically, the Inventory does the following:

- Presents GHGs from community-wide activities in calendar year 2005;
- Forecasts how community-wide emissions will increase by 2020, and 2035 if no behavioral or regulatory changes are made (known as a business-as-usual scenario);
- Adjusts the GHG forecasts to account for reduction efforts mandated by the State of California (State), such as new vehicle standards and fuel standards; and
- Provides County staff, decision-makers, and Steering Committee and Technical Advisory Committee members with adequate information to direct development of an Energy Efficiency Climate Action Plan (EECAP) and establish additional emission reduction targets, if desired.

The Inventory includes the major sources of GHGs caused by activities in the county⁵ and by the County per best practice and consistent with the methods recommended by the California Air Resources Board (CARB), ICLEI-Local Governments for Sustainability, and the Bay Area Air Quality Management District (BAAQMD). The Inventory analyzes the following emissions sources:

- **Energy** – Electricity, natural gas, and residential propane consumed in the county in 2005.
- **Transportation** – Vehicle miles traveled (VMT) to and/or from the county in 2005.
- **Waste** – Methane emissions from waste sent to landfills from the community in 2005.
- **Landfills** – Direct emissions from landfills, for the baseline year, are included in this analysis.
- **Water and Wastewater** – The energy required to extract, filter, move, and treat the water consumed and/or treated in the county in 2005. Direct process emissions from the County's wastewater

⁵ In this document, “county” refers to the unincorporated area within the San Mateo County boundary, excluding areas within incorporated city boundaries. The term “County” refers to San Mateo County government or government operations. The County has jurisdiction over the unincorporated area referred to as the “county” in this Inventory.

treatment facilities and fugitive emissions from septic tanks⁶ in the county are excluded from analysis, as they will be accounted for as appropriate in the County government operations inventory update.

- **Stationary Sources** – Direct emissions from industrial processes in the county that are permitted by the Bay Area Air Quality Management District (BAAQMD).
- **Off-road** – Emissions from agricultural, construction, and lawn and garden equipment/vehicles.
- **Agriculture** – Emissions from fertilizer and agricultural off-road equipment/vehicles.

Carbon sequestration, or simply sequestration, is the physical act of removing carbon dioxide from the atmosphere. The most common sources of sequestration are trees, which consume carbon dioxide during photosynthesis. San Mateo County's vast stock of redwood forests and wetlands are a major source of sequestration. The effect of the County's sequestration have not been quantified or included in the baseline inventory and forecast because this report focuses on emissions that can be mitigated or reduced. The County is currently studying the amount of sequestration potential in the county. When the results of this study become available, to the greatest extent feasible, the emissions benefits will be included in the Energy Efficiency Climate Action Plan as a GHG reduction or credit.

RELATIONSHIP TO THE 2008 ICLEI INVENTORY

In 2008, ICLEI-Local Governments for Sustainability conducted a 2005 community-wide GHG emissions inventory for the unincorporated areas of San Mateo County. Changes to the regulatory structure and incentives to address GHG emissions since the creation of this initial inventory have prompted the County to re-inventory emissions from community-wide sources. This Inventory is a new assessment of GHG emissions in the county.

In response to California Environmental Quality Act (CEQA) Guidelines that went into effect in March 2010, BAAQMD updated its CEQA Guidelines for the San Francisco Bay Area Basin. The purpose of the guidelines is to assist lead agencies in evaluating the air quality impacts of proposed projects and plans. The guidelines also establish thresholds of significance for impacts related to GHG emissions. Plans that comply with BAAQMD's suggested guidelines could serve as a Qualified GHG Reduction Strategy, providing streamlined CEQA tiering for development projects that comply with standards in the plan.⁷

⁶ According to the Local Government Operations Protocol, "Fugitive emissions that are not physically controlled but result from intentional or unintentional releases, commonly arising from the production, processing, transmission, storage, and use of fuels and other substances, often through joints, seals, packing, gaskets, etc."

⁷ The BAAQMD's June 2010 adopted thresholds of significance were challenged in a lawsuit. On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the district had failed to comply with CEQA when it adopted the thresholds. The court found that the adoption of the thresholds was a project under CEQA and ordered the BAAQMD to examine whether the thresholds would have a significant impact

To create a Qualified GHG Reduction Strategy in compliance with BAAQMD guidelines, the County contracted with PMC to create a new inventory that incorporates new BAAQMD-recommended methodologies and addresses all emissions sectors identified by the guidelines. PMC used the 2008 inventory as a starting point for analysis in this Inventory, but re-inventoried emissions as described below. Landfill emissions are the only sector in this Inventory that rely on 2008 inventory findings; due to unavailability of data and informational nature of this sector, the original assessment was found to provide the best approach and facilitate compliance with BAAQMD guidance. In the process of completing the inventory, PMC completed new emissions calculations to use the most up-to-date tools and resources. The primary distinctions between this Inventory and the 2008 inventory prepared by ICLEI include the following:

- Inclusion of new emissions sources not previously inventoried (water).
- Incorporation of refined methodologies for agriculture. The 2008 inventory used a top-down approach to attribute all countywide agriculture emissions to the unincorporated county. This Inventory captures only relevant agriculture emissions from fertilizer use, based on local crop types.
- Calculation of emissions for direct access electricity based on actual activity in the county, as reported by PG&E. The 2008 inventory estimated direct access consumption based on a top-down approach to disaggregate total direct access electricity and natural gas in the incorporated and unincorporated San Mateo County. PG&E did not report direct access natural gas consumption for the county in 2005.
- Calculation of off-road emissions for agricultural equipment, construction equipment, and lawn and garden equipment, consistent with BAAQMD compliance and using more accurate baseline information for the year 2005, based on 2005 emissions data, households, and building permits. The 2008 inventory used 2007 emissions reported by BAAQMD, based on households and jobs.
- Exclusion of emissions for light service equipment included in the 2008 inventory due to overlap with the stationary source emissions reported by BAAQMD and potential double-counting of emissions from energy consumption.
- Inclusion of stationary source emissions in the county reported by BAAQMD.
- Calculation of waste using the California-specific 2009 Landfill Emissions Tool developed by the California Air Resources Board, instead of using national defaults provided by the ICLEI Clean Air and Climate Protection program.

on the environment under CEQA before recommending their use. The court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits. The court issued a writ of mandate ordering the district to set aside the thresholds and cease dissemination of them until the district had complied with CEQA. As the court did not determine whether the thresholds are or are not based on substantial evidence and thus valid on the merits, the BAAQMD guidelines continue to provide substantial evidence in making an independent determination of significance of plan-level GHG impacts pursuant to State CEQA Guidelines Section 15064.7(c).

- Integration of improved emissions factors in the Local Government Operations Protocol (LGOP) V1.1.

DATA PARAMETERS

The Inventory was developed with the best-available tools, data, and methodology; however, as with any GHG inventory, there are limitations to representing all sources of emissions in a local jurisdiction. The main factors that limit GHG inventories include (1) data availability, (2) privacy laws, and (3) deficient methodology. The following sections highlight emissions that cannot be included in a GHG inventory due to these factors. It is estimated that sources not included in the Inventory for reasons of data availability and privacy laws comprise less than 5% of total emissions in the county and are therefore anticipated to have a minimal impact. The emissions excluded for reasons of methodological limitations may be considerable, but it is not possible to estimate their impact on San Mateo County's inventory under current methodological constraints.

I. Data Availability

Lack of available data prevented the calculation of emissions from the following sources for the following reasons:

- Propane use – Propane is essentially an unregulated fuel in California (except for storage and safety issues, which are regulated). Because it is an unregulated commodity, no data is collected by the State on propane sales or usage. While propane use in rural San Mateo County is likely, the availability of such data prevents accurate calculations of emissions from propane. In addition, propane is not anticipated to be widely used and is likely to contribute minimally to community-wide emissions. A protocol for calculating GHG emissions is currently under development, and is anticipated to provide future guidance that will inform the accurate collection of propane use in the county.
- Refrigerants – Similar to propane, above, the amount of fugitive refrigerant emissions cannot be calculated because sales are not tracked.

2. Privacy Laws

- Commercial, industrial, and institutional electricity and natural gas are combined into a non-residential category due to the California 15/15 rule. The 15/15 rule was adopted by the California Public Utilities Commission in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 Rule requires that any aggregated information provided by the utilities must include at least 15 customers and that a single customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened already using the 15/15 Rule, the customer must be dropped from the information provided.

3. Unavailability of Protocol for Life-Cycle Emissions

- Industry protocol at this time does not recommend inclusion of life-cycle emissions in community-wide local government GHG inventories. A protocol for estimating life-cycle emissions is still under development at this time. Life-cycle emissions are emissions associated with the production and disposal of items consumed by a community (i.e., “cradle-to-grave”). For instance, a life-cycle assessment of vehicle emissions would include those from designing, extracting raw materials, producing, delivering, and disposing of each car in the county. In contrast, this analysis only captures how much that car is driven in the county consistent with standard protocol.

4. Other Excluded Emissions

Other GHG emissions sectors have been excluded from this Inventory, as they are negligible in size or relevance. Caltrain operates heavily within San Mateo County but only passes through unincorporated areas briefly along its route. Considering the amount of time and effort it would take to quantify these emissions with marginal impact in the baseline emissions inventory and limited control over Caltrain operations, these emissions have been omitted. The Half Moon Bay Airport is located within unincorporated land and is operated by the County of San Mateo. However, emissions information was not available for takeoffs and landings at this airport. San Francisco Airport (SFO) is also located in unincorporated San Mateo County, but it is operated by the City and County of San Francisco, which has primary regulatory authority over land use at SFO. SFO has a separate climate action planning effort. For these reasons, these two airports were excluded from this Inventory. Review of similar inventories, including the California Greenhouse Gas Inventory prepared by the California Air Resources Board (CARB), indicates that those sources not included in the Inventory for the reasons stated above comprise less than 5.0% of total emissions in the county. The emissions identified in this Inventory are primarily GHGs that the community has directly caused and has the ability to reduce through implementation of conservation actions, a Qualified GHG Reduction Strategy, or corresponding efforts.

KEY TERMS AND TIMELINES

The following terms are used throughout the Inventory. These concepts are fundamental to understanding the contents of the Inventory.

Baseline year: Emissions are quantified for calendar year 2005, due to the availability of reliable data and consistency with the County’s General Plan and Assembly Bill (AB) 32. A baseline year gives the County a basis of comparison for future reduction efforts and inventories.

Carbon dioxide equivalent (CO₂e): The universal unit for representing the six different GHGs (see definition of greenhouse gas emissions, below) in one single unit by converting each gas into the equivalent potency of carbon dioxide. CO₂e is commonly expressed in metric tons, each of which equals 2,205 pounds.

Greenhouse gas emissions: Gases that trap heat in the earth’s atmosphere are called greenhouse gases, or GHGs. GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). While many of these gases occur naturally in the atmosphere, modern human activity has led to a steep increase in the amount of GHGs released into the

atmosphere over the last 100 years. Collectively, these gases intensify the natural greenhouse effect, thus causing global average surface temperatures to rise, which in turn affects global climate patterns. GHGs are often quantified in terms of CO₂ equivalent, or CO₂e, a unit of measurement that equalizes the potency of GHGs.⁸

Scope: Emissions sources are also categorized by scope to help identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. Scopes are discussed in further detail below.

Scope 1. Direct emissions caused by activities in the county in 2005 and emitted within the county. Examples of Scope 1 sources include the combustion of fuels such as gasoline and natural gas.

Scope 2. Indirect emissions are caused by activities within the county in 2005 but emitted outside of the county. Examples of Scope 2 sources include electricity used within the community yet generated at power plants outside of the county. These emissions should be included in the community-wide analysis, as they are the result of the community's electricity consumption.

Scope 3. All other indirect emissions that occur as a result of activity within the community. An example of a Scope 3 source is methane emissions from solid waste generated in the community in 2005 yet released over the lifetime of the waste. Scope 3 emissions have the greatest amount of variability and are less attuned to the specific community than Scope 1 and 2 sources.

Sector: Emissions are grouped by the type of activity that generated the emissions, such as transportation, residential energy use, non-residential energy use, and more.

II. BASELINE COMMUNITY-WIDE GHG INVENTORY

SUMMARY

This Inventory includes Scope 1, Scope 2, and Scope 3 sources from the following sectors: residential energy, non-residential energy, transportation, off-road equipment, water, wastewater, solid waste, stationary sources, and agriculture.

Emissions from county sources totaled 905,090 metric tons of carbon dioxide equivalents (MTCO₂e) in the baseline year 2005. As shown in **Table B-1** and **Figure B-1**, the transportation sector is the largest contributor at 53%, producing approximately 479,400 MTCO₂e in 2005. Emissions from the commercial and industrial energy sector were the next largest contributor, accounting for a combined 18% of the total emissions, producing approximately 160,900 MTCO₂e. Direct emissions from landfills accounted for 14% of the total emissions (123,000 MTCO₂e), and emissions from residential energy use comprised 10% of the total (93,100 MTCO₂e). Emissions were also inventoried for lawn and garden and construction equipment (also 'off-road

⁸ Refer to the Intergovernmental Panel on Climate Change for more information: <http://www.ipcc.ch/>.

equipment; 4% of total emissions, 35,800 MTCO₂e), solid waste (1% of total emissions, 8,380 MTCO₂e), agriculture (3,000 MTCO₂e and <1%), water and wastewater (1,500 MTCO₂e and <1%), and stationary point sources (stationary) (<1% with 10 MTCO₂e).

Table B-1 and **Figure B-1** include stationary emissions from the proxy year of 2009, the closest available year to 2005. Stationary source emissions are defined as any fixed emitter of air pollutants, such as power plants, stationary generators, petrochemical plants, and other heavy industrial sources. While some of these emissions may overlap with energy-related emissions, others may be missed if not included in the Inventory. BAAQMD provided a list of stationary source emissions within the County of San Mateo, and sources from the county totaled 10 MTCO₂e or <1% of total community-wide emissions in 2005. Stationary source emissions are discussed in this Inventory for informational purposes only, as stationary source emissions are influenced by market forces beyond the County's local influence and are instead best addressed and regulated by BAAQMD or through federal and state programs. In addition, direct landfill emissions occurring in the baseline year for waste generated both within and outside of the unincorporated county are included in this Inventory as suggested by BAAQMD. The County has limited control over the operation of landfills in the county and is unable to directly affect the emissions generated from previously generated waste.⁹ The baseline inventory is intended to guide future local policy decisions that relate to emissions within the County's influence; therefore, stationary source emissions are excluded from all further discussions of this Inventory after **Table B-1** and **Figure B-1**.

TABLE B-I – 2005 COMMUNITY-WIDE BASELINE EMISSIONS BY SECTOR

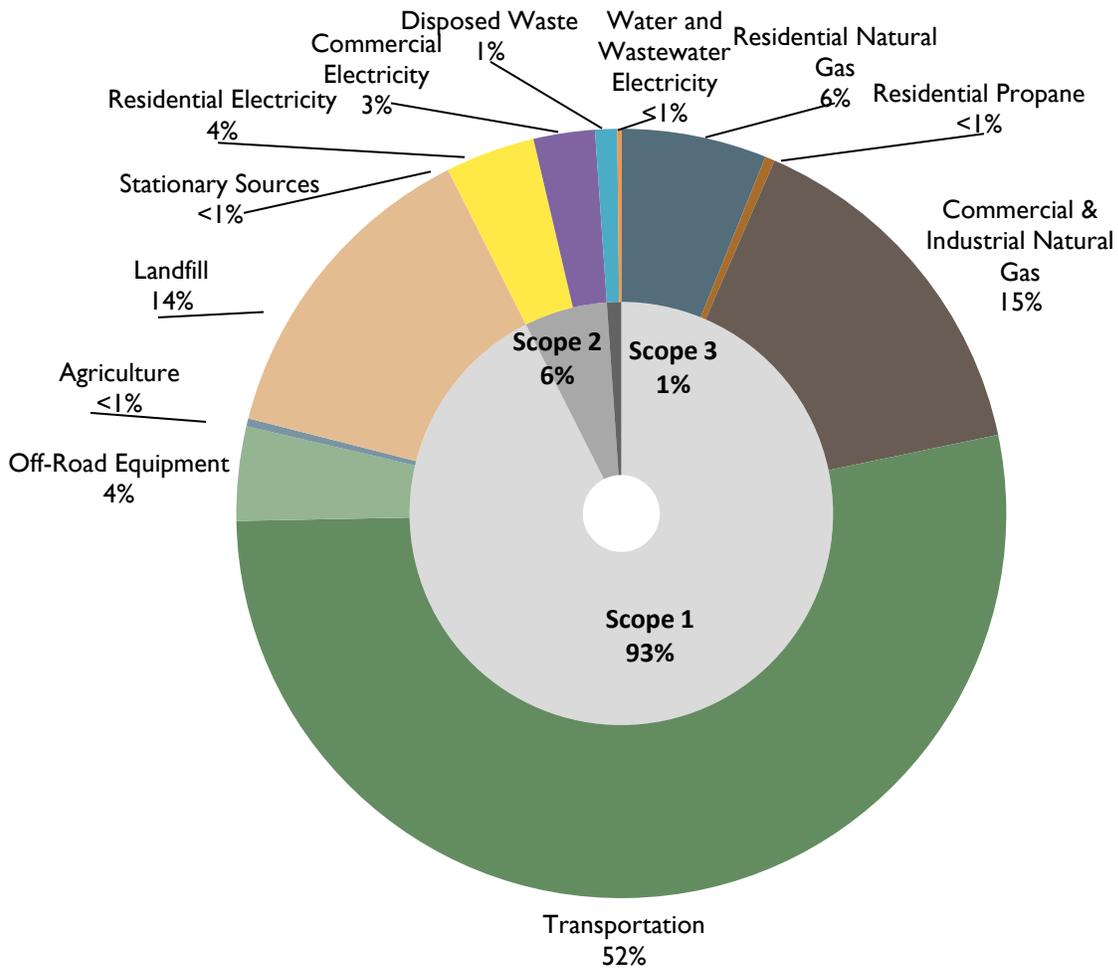
| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|------------------------------------|---------------------|
| Residential Energy | 93,100 | 10% |
| Commercial and Industrial Energy | 160,900 | 18% |
| Solid Waste | 8,380 | 1% |
| Transportation | 479,400 | 52% |
| Water and Wastewater | 1,500 | <1% |
| Off-Road | 35,800 | 4% |
| Landfill | 123,000 | 14% |
| Stationary | 10 | <1% |
| Agriculture | 3,000 | <1% |
| TOTAL | 905,090 | |

* Due to rounding, the total may not be the sum of component parts.

⁹ At this time, the County is interested in purchasing methane emitted by landfills, but is precluded from doing so based on existing agreements between landfills and other jurisdictions. Regardless, even the purchase of methane for the production of energy would not result in a net decrease in GHG emissions.

Excluding stationary sources and direct landfill emissions will allow the County to set accurate emissions reduction targets for emissions that the County is able to affect. It is unknown whether or how stationary source emissions and landfill emissions will change in the future; however, new potential emitters will be approved and noticed by BAAQMD through current permitting processes. The exclusion of stationary sources from local inventories and reduction plans is also generally supported by BAAQMD. With stationary sources discounted from the Inventory, the County of San Mateo emitted approximately 782,080 MTCO₂e in 2005.

FIGURE B-1 – 2005 COMMUNITY-WIDE BASELINE EMISSIONS BY SCOPE AND SECTOR, INCLUDING STATIONARY SOURCE EMITTERS AND LANDFILLS



Additional details on the activities represented in the Inventory are provided in **Table B-2** and **Figure B-2** below, which show the distribution of emissions excluding stationary source emitters and landfill emissions. The table summarizes activity data units, data sources, and emissions scopes for each sector. **Figure B-2** shows that the majority of emissions are within Scope 1 (93%) and Scope 2 (6%). These emissions were either emitted within the county or directly and immediately caused by activity within the county in 2005. Scope 3 emissions constitute 1% of the Inventory and include emissions that are caused by activity within the county, but are

either emitted over long periods or have a higher level of uncertainty than Scope 1 and 2 emissions under best-available methodologies.

TABLE B-2 – COMMUNITY-WIDE DATA SOURCES AND SCOPES

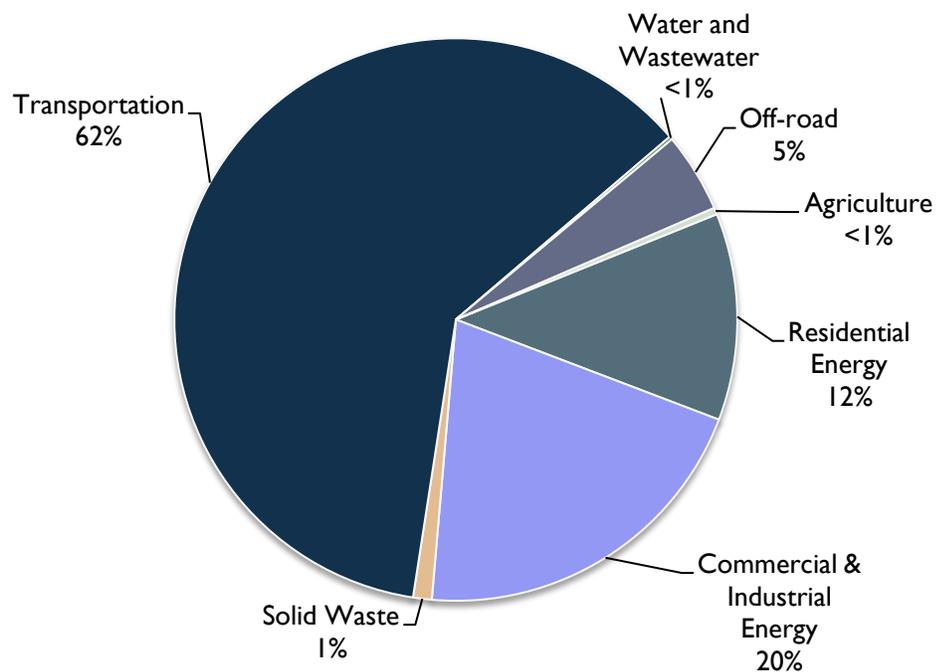
| Sector | Scope | Subsector | Activity | Coefficient Source | Annual MTCO ₂ e | Percentage of Annual MTCO ₂ e |
|--------------------------------|-------|---------------------------------|---------------------------------|-------------------------------------|----------------------------|------------------------------------------|
| Residential Energy | 1 | Propane | 627,200 Gallons | LGOP V1.1 | 3,700 | <1% |
| | 1 | Natural Gas | 10,396,000 therms | PG&E, LGOP V1.1 | 55,300 | 6% |
| | 2 | Electricity | 152,462,000 kWh | PG&E, LGOP V1.1 | 34,100 | 4% |
| Commercial & Industrial Energy | 1 | Natural Gas | 25,858,000 therms | PG&E, LGOP V1.1 | 137,600 | 15% |
| | 2 | Electricity | 99,425,000 kWh | PG&E, LGOP V1.1 | 22,200 | 3% |
| | 2 | Direct Access Electricity | 2,637,000 kWh | PG&E, LGOP V1.1 | 1,100 | <1% |
| Solid Waste | 3 | Municipal Solid Waste | 43,600 tons | CalRecycle, CARB | 8,050 | 1% |
| | 3 | Alternative Daily Cover | 3,600 tons | CalRecycle, CARB | 300 | <1% |
| Transportation | 1 | Daily Vehicle Miles Traveled | 845,364,000 VMT | Fehr & Peers | 479,400 | 61% |
| Water and Wastewater | 3 | Water Supply Energy Use | 5,415 MG water 2,390,000 kWh | BAWSCA, CEC, CPUC, San Mateo County | 500 | <1% |
| | 3 | Wastewater Treatment Energy Use | 2,035 MG water 3,321,000 kWh | BAWSCA, CEC, CPUC, San Mateo County | 1,000 | <1% |
| Off-Road | 1 | Lawn and Garden | 34,500 gallons diesel | CARB | 300 | <1% |
| | | | 137,000 gallons gasoline | | 800 | <1% |
| | 1 | Constructi | 9,500 gallons | CARB | 34,300 | 4% |

APPENDIX B: BASELINE GHG INVENTORY

| Sector | Scope | Subsector | Activity | Coefficient Source | Annual MTCO ₂ e | Percentage of Annual MTCO ₂ e |
|---------------|-------|-----------------------|-----------------------------------------|------------------------------|----------------------------|------------------------------------------|
| Agriculture | 1 | on | diesel 69,000 gallons gasoline | | 400 | <1% |
| | | Off-road Equipment | 5,867 acres | Agricultural Commissioner | 1,600 | <1% |
| | | Fertilizer | 639,000 lbs Nitrogen (Fertilizer) | UC Davis, CARB | 1,400 | <1% |
| TOTAL* | | | | | 782,080 | 100% |

* Due to rounding, the total may not be the sum of component parts

FIGURE B-2 – 2005 COMMUNITY-WIDE BASELINE EMISSIONS BY SECTOR, EXCLUDING STATIONARY SOURCE EMITTERS AND LANDFILLS



SECTOR DETAIL

Transportation

Transportation emissions accounted for 62% of the 2005 Inventory (excluding stationary source emitters and landfills, see **Figure B -2**). As with the majority of California municipalities, travel by on-road motorized vehicles constitutes the greatest percentage of GHG emissions in the county. Using origin-destination analysis, three types of vehicle trips were tracked in the county:

- Internal-Internal: Vehicle trips that remained inside the county
- Internal-External and External-Internal: Vehicle trips that have an ending or a beginning in the county
- External-External: Vehicle trips that pass through the county

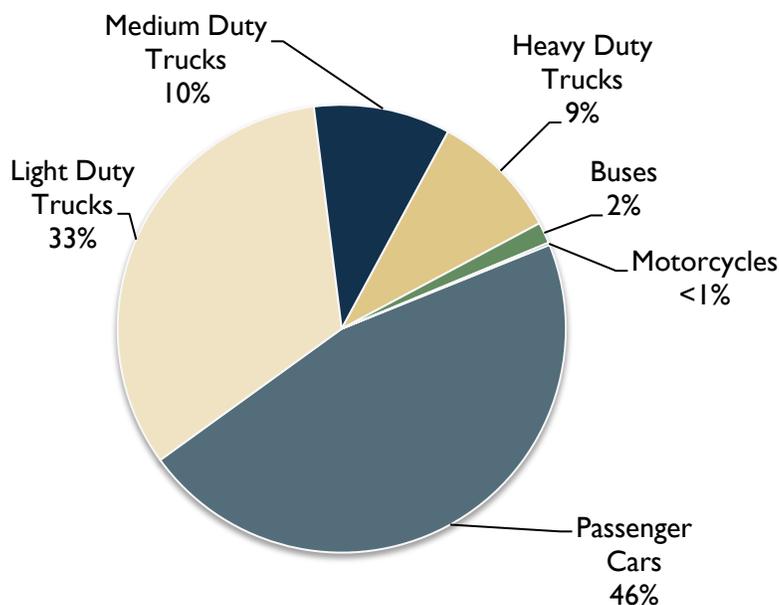
Fehr & Peers calculated vehicle miles traveled (VMT) for each of the three types of vehicle trips using the recommendation of the Regional Target Advisory Committee (RTAC), the body responsible for Senate Bill 375 target setting. VMT from trips of type 1, 2, and 3 were counted 100%, 50%, and 0% respectively toward jurisdiction-generated VMT.¹⁰ The VMT results are summarized in **Attachment B1**.

Transportation-related greenhouse gas emissions were calculated using the California Air Resources Board Emissions Factor 2007 (EMFAC2007) software for all on-road vehicle trips in the county.¹¹ The GHG emissions per vehicle type are shown in **Figure B-3**. Light-duty autos such as compact cars and light-duty trucks such as SUVs and pickup trucks contribute 46% and 33% of transportation-related emissions, respectively. The remaining 33% of emissions are the result of commercial vehicles, motorcycles, and buses. EMFAC2007 provides carbon dioxide emissions according to the unique vehicle composition of each county in California, including San Mateo County, which was used for this Inventory. Individual GHGs such as carbon dioxide, methane, and nitrous oxide are converted to CO₂e by multiplying the CO₂ emissions by a conversion factor provided by the U.S. Environmental Protection Agency of 100/95.

¹⁰ Fehr & Peers identified 396,821 daily external-external VMT in unincorporated San Mateo County (VMT that pass through San Mateo County without originating or ending in San Mateo County). This is equivalent to 137,696,887 annual external-external VMT (396,821 daily VMT multiplied by an annual conversion factor of 347 day equivalents per year). Since the County is unable to directly impact these VMT, they are reported for informational purposes only and are not included in the Inventory.

¹¹ Emissions from aircraft at the two airports in the county are excluded from the transportation sector and this Inventory. The San Francisco International Airport lies within the county, but has already completed a facility-specific GHG emissions inventory and developed strategies to reduce emissions. Further, the County cannot directly affect GHG emissions at the airport. The Half Moon Bay Airport is located within unincorporated land and is operated by the County of San Mateo and will be accounted for in the municipal inventory currently taking place.

FIGURE B-3 – TRANSPORTATION-RELATED GHG EMISSIONS BY VEHICLE TYPE



Energy

With all scopes and sectors aggregated, 32% of total community-wide emissions in the year 2005 came from the “built environment” (excluding stationary source emitters and landfill emissions); see residential and non-residential energy sectors in **Figure B-2**. The built environment comprises residential, commercial, and industrial natural gas and electricity consumption. As shown in **Figure B-4**, non-residential natural gas use makes up 55% of emissions from the built environment, while non-residential electricity, residential electricity, residential gas, and direct access electricity make up 22%, 14%, 9%, and <1%, respectively.¹² Residential propane has been included in this revised inventory based on guidance from the Project Steering Committee. This new sector captures GHG emissions caused by homes that utilize propane as the sole source of space heating. Residential propane comprises less than 1% of total energy emissions in 2005.

Pacific Gas and Electric Company (PG&E) provided electricity and natural gas consumption on May 15, 2011. Commercial and industrial electricity were combined in the non-residential category due to the California 15/15 Rule (see Privacy Laws subsection). PG&E also reported direct access electricity use. Direct access reflects the ability of residents and businesses in San Mateo County to purchase electricity directly from their source of choice. As many different sources of electricity contribute to direct access, the 2005 California grid average electricity emissions coefficients were used for translation into emissions.

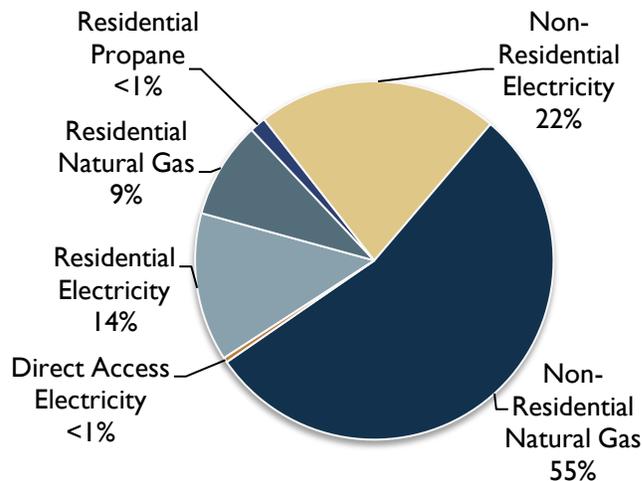
PG&E provided a 2005 carbon dioxide (CO₂) coefficient for electricity and natural gas. Emissions coefficients for methane (CH₄) and nitrogen dioxide (N₂O) emissions were provided by the California Air Resources Board’s Local Government Operations Protocol (LGOP) version 1.1 and were converted into carbon dioxide equivalents

¹² PG&E reported direct access electricity for 2005 (approximately 2,637,000 kWh). No direct access natural gas was reported.

and added to the CO₂ coefficient to create a carbon dioxide equivalent (CO₂e) coefficient that integrates all three of the GHG emissions caused by energy consumption.

Total household propane use for all of San Mateo County was calculated using the County Residential Propane Model (CRPM) produced by the Propane Education and Research Council and ICF International (2010). The Project Team used information regarding the use of propane as the main heating fuel reported by the 2005 American Community Study by the US Census Bureau to calculate the proportion of homes countywide using propane in San Mateo County. This data was applied to unincorporated San Mateo County using the Association of Bay Area Governments' 2009 household projections. Tables G.1 and G.4 of the LGOP v1.1 were used to calculate the amount of CO₂, CH₄ and N₂O emissions.

FIGURE B-4 – BUILT-ENVIRONMENT GHG EMISSIONS BY SECTOR



Solid Waste

Solid waste emissions are separated into two sources, direct emissions from closed landfills within the county during the baseline year and future emissions from community-generated waste.

Direct Landfill Emissions

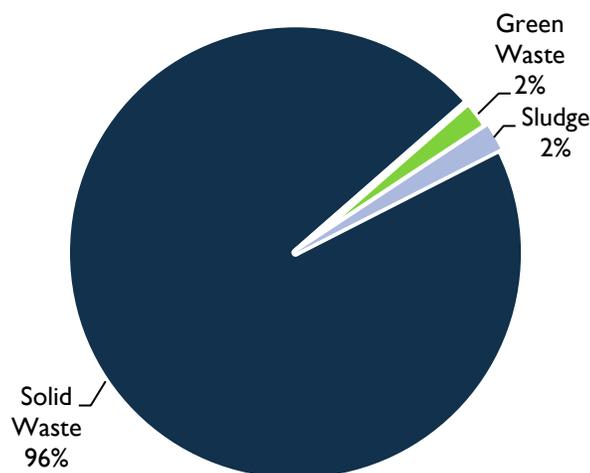
Four landfills lie within the county. Of these four landfills, only two are operational. ICLEI obtained data and calculated emissions for two landfills: the operational Ox Mountain Sanitary Landfill and the closed Pescadero Landfill. The calculations in the 2008 inventory were found to use the best available data and approaches, and were used to estimate landfill emissions in this Inventory. Data was unavailable for the other two landfills and is not included in this Inventory. Both landfills emit methane gas and will continue to do so for generations to come. It should be noted that the emissions from the Pescadero Landfill will decrease as time goes on and Ox Mountain's will increase until its projected closure in 35 years. Emissions from these two landfills totaled 123,000 MTCO₂e in 2005 and are a measurement of the direct methane gas emitted by the landfills. Methane

emissions from the closed landfill are considered Scope 1 because they are direct fugitive emissions. As stated before, these emissions are not included in the baseline and are reported for informational purposes only.

Community Waste Emissions

Waste contributed 1% of the county's emissions in 2005 (excluding stationary source emitters and landfill emissions). This emissions sector includes solid waste, green waste and sludge disposed by the community in 2005 and sent to managed landfills or dumps. Solid waste disposed of by the community in 2005 will contribute 35,100 MTCO₂e over the next 100 years as the waste decomposes. Methane generation from waste sent to landfills in 2005 was calculated using the CARB Landfill Emissions Calculator v1.3 and an average methane recovery or capture factor of 75%. Emissions from community waste are considered Scope 3 emissions because they are not generated in the base year but will result from the decomposition of waste generated in 2005 over the full 100-year cycle of its decomposition. In 2005, the community sent approximately 47,200 tons of waste to various landfills across the state. The 2004 California Statewide Waste Characterization Study provides standard waste composition for the State of California, which allows us to account for the different emission rates of various materials.¹³ **Figure B-5** below shows waste emissions by source.

FIGURE B-5 – WASTE EMISSIONS BY SOURCE



Off-Road

Off-road emissions consist of emissions created by construction equipment and equipment related to lawn and garden activities. Off-road emissions accounted for 5% of emissions in 2005 (excluding stationary source emitters and landfill emissions). CARB's OFFROAD 2007 program provides construction and lawn and garden activity per county in the state. Construction equipment includes off-road tractors, diggers, backhoes, cranes, and graders. Lawn and garden equipment includes lawn mowers, tillers, leaf blowers, chainsaws, and

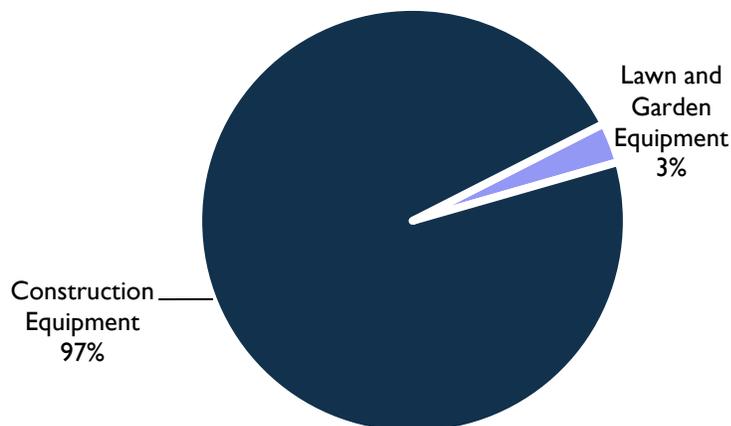
¹³ <http://www.ciwmb.ca.gov/Publications/default.asp?pubid=1097>

commercial turf equipment. While several other off-road equipment uses contribute to emissions in San Mateo County, methodological limitations prevent the accurate inclusion of countywide marine, recreational, airport, or other equipment and vehicles to each individual jurisdiction within the county. For construction and lawn and garden equipment, BAAQMD has provided guidance to calculate emissions at a jurisdiction level. As shown in **Figure B-6**, GHG emissions from construction and lawn and garden activity make up 97% and 3% of off-road emissions, respectively. Per BAAQMD guidance, county-level activity and emissions for off-road equipment were attributed to the county using the following indicators:

- Total county construction equipment emissions were attributed to the county using the proportion of new housing units built within the unincorporated county compared to the entire county using the U.S. Department of Housing and Urban Development's (HUD's) State of the Cities Data Systems building permit inventorying system.
- Total county lawn and garden emissions were attributed to the county using the proportion of existing households within the unincorporated county compared to the entire county using California Department of Finance (DOF) figures for 2005.

Emissions from off-road equipment and vehicles were determined using CARB's OFFROAD 2007 program. OFFROAD provides the fuel consumption and emissions output for each type of off-road equipment in California per county, equipment type, fuel type, and year. Please note that agricultural off-road equipment and vehicles are included in the agricultural sector of this Inventory.

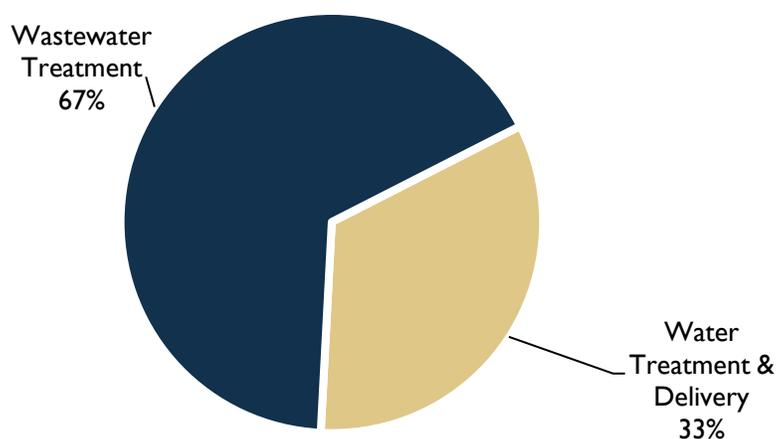
FIGURE B-6 – OFF-ROAD GHG EMISSIONS BY EQUIPMENT CATEGORY



Water and Wastewater

Water and wastewater emissions accounted for <1% of total GHG emissions in 2005 (see **Table B-2**). This inventory includes emissions from the electricity used to process, treat, and move water and wastewater to and from the county. It should be noted that some of this electricity use did not take place within the county, but was used to deliver water to San Mateo County. GHG emissions by type of activity are summarized in **Figure B-7**. While this sector may potentially double-count electricity consumption captured in the energy sector, water and wastewater emissions are calculated separately to comply with BAAQMD guidance. The overlap between electricity and water and wastewater energy is anticipated to have a negligible effect on the Inventory, due to the small contribution of the water and wastewater sector (less than 1% of the Inventory). Due to data limitations and diversity of water and wastewater treatment providers in the county, the analysis relies on averages for the service population using best available data focused on the San Francisco Peninsula.

FIGURE B-7 – WATER AND WASTEWATER GHG EMISSIONS BY WATER ACTIVITY



Water-related energy for the calculated water consumption comes from several sources:

- SFPUC-delivered water – The energy related to the San Francisco Public Utilities Commission (SFPUC) water is that used to deliver and treat water from the Hetch Hetchy Reservoir in Yosemite National Park. Information related to SFPUC-delivered water is provided by the Bay Area Water Supply and Conservation Agency (BAWSCA) for 2005. The electricity per gallon of delivered water coefficient is provided in the California Public Utilities Commission’s 2010 water intensity study and the California Energy Commission’s (CEC) 2006 water-related energy Inventory.

- Well water – Properties in the more rural areas of San Mateo County rely on well water. The energy related to this end-use is also derive from the 2006 CEC water energy Inventory assuming an average well depth provided in a 2010 groundwater study by the County of San Mateo.
- County water and wastewater – In certain areas, the County provides water and wastewater treatment. The use of an average consumption figure for all service population in the county is assumed to capture this activity and falls under the calculations described above under 1 and 2.

Indirect emissions from the conveyance, treatment, and delivery of water and the treatment and disposal of wastewater were provided by the CPUC's 2010 water-energy relation Inventory and the CEC's 2006 water energy Inventory. Due to the diversity of service providers and treatment processes that treat water in the county, assuming statewide averages was the most effective approach to determine emissions from these processes that the County, in most cases, has little to no control over.

TABLE B-3 – WATER CONSUMPTION BY SOURCE

| | Supply (MG) | Electricity Use (kWh) | Emissions (MTCO ₂ e) |
|----------------------|-------------|-----------------------|---------------------------------|
| SFPUC – Hetch Hetchy | 5,145 | 2,324,000 | 500 |
| Wells | 271 | 66,000 | <100 |
| TOTAL | 5,415 | 2,390,000 | 500 |

Agriculture

Agricultural processes account for <1% of the Inventory (excluding stationary and landfill emissions) (see **Table B-2**). Two types of agricultural emissions sources are analyzed in this Inventory: (1) emissions from agricultural equipment and vehicles such as tractors, and (2) emissions from crop management, specifically application of fertilizer. A summary of agriculture GHG emissions is presented in **Figure B-8**.

Total county agricultural emissions from equipment and vehicles were attributed to the unincorporated county using the proportion of agricultural land within the entire county compared to the unincorporated county. Countywide crop data was provided by the office of the San Mateo County Agricultural Commissioner/Sealer of Weights and Measures, and aggregated acres within unincorporated lands were provided by the County of San Mateo. The percentage of acres within unincorporated lands was applied to the total countywide acres by type (field, fruit, and vegetables) in order to assume a general breakdown of acres by crop type. Emissions from livestock were not included in this Inventory due to the lack of confined animal facilities in the county, minimal population of grazing cattle, and lack of information to disaggregate countywide cattle to the unincorporated areas. The number of cattle and livestock in the county is limited and therefore the emissions are not intense enough to be included.

Average nitrogen fertilizer use for each crop was identified using University of California Cooperative Extension cost reports (see **Table B-4**). An equation provided by the California Air Resources Board's 2009 Inventory of statewide emissions was used to calculate grams of N₂O per pound of nitrogen fertilizer applied per acre.

Grams of N₂O were converted into metric tons of CO₂e using factors provided in the Local Government Operations Protocol Version 1.1.

FIGURE B-8 – AGRICULTURE GHG EMISSIONS BY ACTIVITY

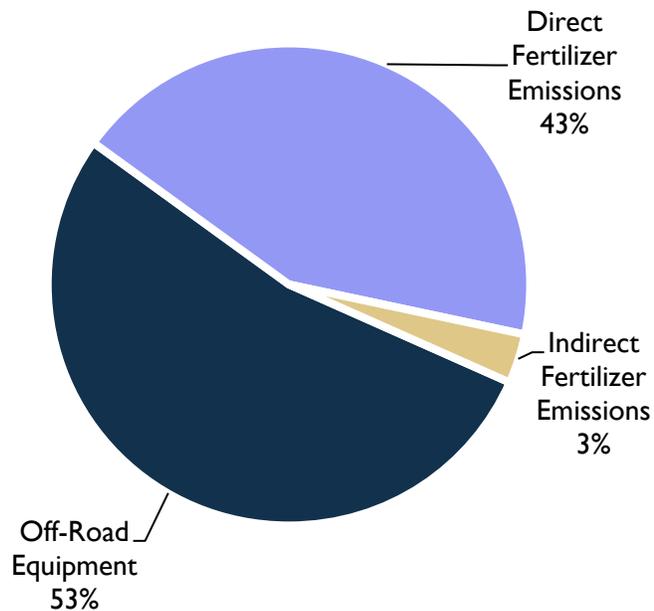


TABLE B-4 – AGRICULTURAL LAND, FERTILIZER & EMISSIONS BY CROP TYPE

| Crop Type | Assumed Unincorporated Acres | Average lbs N Applied per Acre per Year | Total Direct & Indirect Emissions (MTCO ₂ e) |
|-----------------|------------------------------|-----------------------------------------|---------------------------------------------------------|
| Vegetable Crops | 4,433 | 104 | 1,020 |
| Field Crops | 1,061 | 150 | 350 |
| Wine grapes | 164 | 10 | – |
| Misc. Fruit | 131 | 95 | 30 |
| Berries | 78 | 64 | 10 |
| TOTAL | | 424 | 1,400 |

III. 2020, AND 2035 GHG FORECAST

A GHG emissions forecast is an estimate of how GHG emissions will change in the future based on anticipated changes in population, jobs, households, commercial activity, and driving patterns. This GHG emissions forecast of community-wide emissions focuses on two target years: 2020, and 2035. The 2020 year is estimated for consistency with Assembly Bill 32 targets, and the year 2035 is projected to create a parallel with Senate Bill 375. The presentation of three forecast years presents the County's opportunities to demonstrate sustained success of reducing emissions.

BUSINESS-AS-USUAL EMISSIONS

A business-as-usual projection is an estimate of how emissions would grow if consumption trends and efficiencies remain at their 2005 levels yet the number of people, households, and jobs continue to grow in San Mateo County. In other words, it is the status quo scenario before state, regional, and local reduction efforts are taken into consideration. The business-as-usual projection utilizes the demographic projections from the Association of Bay Area Governments (ABAG) 2009 regional forecasts of populations, households, and jobs along with estimated growths in off-road equipment provided by OFFROAD2007 and VMT projections provided by Fehr & Peers (see **Table B-5**).

TABLE B-5 –2020 AND 2035 GHG FORECAST INDICATORS

| | Emissions Sector | 2005 | 2020 | 2035 | Source |
|----------------------------------------------|----------------------------------|-------------|-------------|-------------|---------------------------|
| Population | -- | 63,600 | 68,900 | 71,300 | ABAG 2009 |
| Employment | Commercial and Industrial Energy | 44,280 | 53,550 | 62,280 | ABAG 2009 |
| Service Population (Residents + Jobs) | Waste, Water & Wastewater | 107,880 | 122,450 | 133,580 | ABAG 2009 |
| Households | Residential Energy | 21,300 | 23,000 | 23,830 | ABAG 2009 |
| Off-Road Agriculture ² | Off-Road Agriculture Equipment | 1,143 | 1,199 | 1,284 | OFFROAD2007 |
| Off-Road Construction Equipment ¹ | Off-Road Construction | 5,699 | 7,106 | 8,625 | OFFROAD2007 |
| Off-Road Lawn & Garden ¹ | Off-Road Lawn & Garden | 280,525 | 319,362 | 364,281 | OFFROAD2007 |
| Vehicle Miles Traveled ³ | Transportation | 845,364,176 | 893,637,775 | 941,912,068 | Fehr & Peers ³ |

1. The agriculture forecast accounts for changes to emissions from agricultural equipment. Emissions from crop management were assumed to remain constant.

2. Pieces of equipment.

3. Fehr & Peers created forecasts using the 2035 C/CAG model. Refer to **Appendix B** for more information.

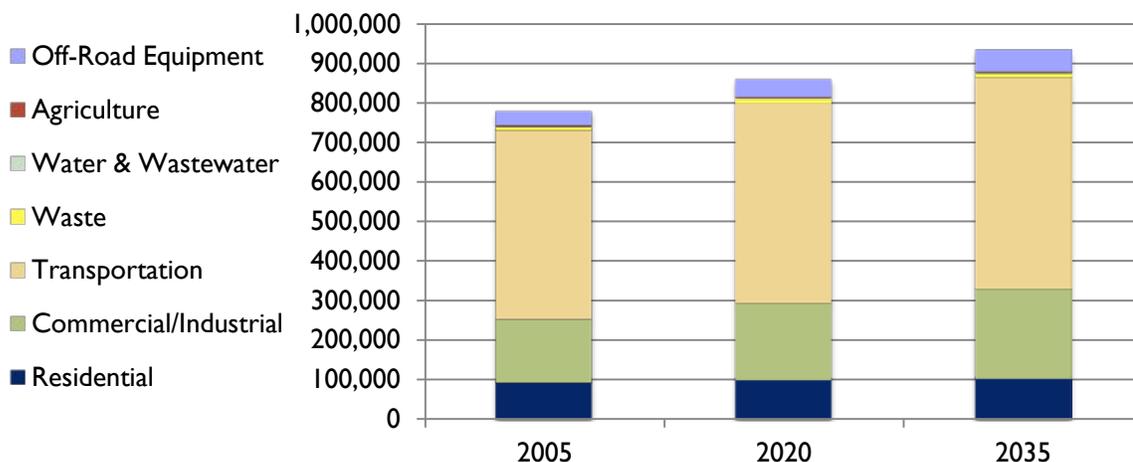
As shown in **Table B-6** and **Figure B-9**, emissions are anticipated to grow 10% from 2005 to 2020 and 19% from 2005 to 2035.

TABLE B-6 –2020 AND 2035 BUSINESS-AS-USUAL GHG FORECAST (MTCO₂E)

| Sector | 2005 Baseline | 2020 | 2035 |
|-----------------------------|----------------|----------------|----------------|
| Residential Energy | 93,100 | 100,500 | 104,200 |
| Non-Residential Energy | 160,900 | 194,600 | 226,300 |
| Solid Waste | 8,380 | 9,500 | 10,400 |
| Transportation | 479,400 | 506,800 | 534,200 |
| Water and Wastewater | 1,500 | 1,700 | 1,900 |
| Off-Road | 35,800 | 44,600 | 53,900 |
| Agriculture | 3,000 | 3,100 | 3,400 |
| TOTAL | 782,080 | 860,800 | 934,300 |
| Percentage Change from 2005 | | 10% | 19% |

** Due to rounding, the total may not be the sum of component parts.*

FIGURE B-9 – BUSINESS-AS-USUAL GHG FORECAST (MTCO₂E)



Emissions related to energy, water, wastewater, and waste are anticipated to grow linearly with projected population and job growth. Agricultural emissions will remain constant and without change until accurate projections of acres of farmland can be analyzed. On-road vehicle miles traveled (VMT) in 2035 were modeled by Fehr & Peers using the C/CAG Travel Demand Model (TDM) assuming no intervening VMT reduction measures. The C/CAG TDM integrates the impact of regional programs on VMT through factors such as trip

distribution and mode choice. Fehr & Peers estimated 2020 VMT forecasts by linearly extrapolating between the 2005 base year results and the 2035 model results. The 2010, 2020, and 2035 VMT estimates modeled by Fehr & Peers are summarized in **Attachment B1**. VMT estimates were converted to GHG using the California Air Resources Board EMFAC2007 software.

IMPACT OF STATE REDUCTION EFFORTS TO BUSINESS-AS-USUAL EMISSIONS

The State of California has been proactive in reducing GHG emissions. Several regulations and efforts at the state level will lessen the County of San Mateo's future GHG emissions, including vehicle standards, building standards, and the renewable energy content of electricity. The state actions summarized below are incorporated into the business-as-usual forecast to create a more realistic estimate of the county's future emissions. This adjusted forecast is detailed in **Table B-7**. Additional details on the adjusted forecast are provided in **Appendix B2**.

California Green Building Standards Code (CalGreen): The 2008 Title 24 update went into effect on January 1, 2010. The energy reductions quantified in the forecast are the mandatory improvements over the 2005 Title 24 code that were established by the update. These are statewide standards applied at the local level by city and county agencies through project review. The 2008 Title 24 Energy Efficiency Improvements in comparison to 2005 baseline Title 24 efficiency standards are provided by the California Energy Commission (CEC).

The calculation of CalGreen energy reductions assumes that all development between 2010 and 2035 will meet Title 24 2008 minimum efficiency standards. It also assumes that all growth in natural gas and electricity sectors is from new construction.

AB 1493 (Pavley) Vehicle Standards: California's Pavley regulations were established by AB 1493 in 2002. They require new passenger vehicles to reduce tailpipe GHG emissions from 2009 to 2020. Reductions from the Pavley regulations were calculated using the method included in an EMFAC2007 post-processing tool provided by CARB and supported by BAAQMD. Emissions reductions per model year and vehicle class were applied to San Mateo County's transportation emissions.

California Solar Initiative: The California Solar Initiative (CSI) is a state program that provides cash rebates for the installation of an electric solar panel system. In order to qualify, the customer must buy electricity from one of California's three investor-owned utilities (IOUs – Pacific Gas and Electric, Southern California Edison, or San Diego Gas & Electric).

California's Renewable Portfolio Standard (RPS): One of the most ambitious renewable energy standards in the country, RPS mandates that 33% of electricity delivered in California is generated by renewable sources like solar, wind, and geothermal by 2020. The California RPS was first codified in 2002 by Senate Bill 1078 (requiring 20% renewable electricity mix by 2010) and further strengthened in April 2011 with the adoption of Senate Bill X 1-2 (requiring 33% renewable electricity mix by 2020). The RPS intended to boost the economy and establish California as a center for the development and use of renewable energy.

Despite the 2020 goal of California’s RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. In 2010, the California Public Utilities Commission, the agency responsible for regulating and tracking the progress of RPS, reported that 18% of California’s electricity came from renewable sources in 2010, missing the 20% goal by 2%. California utilities have more than enough renewable electricity under consideration to meet the 33% target by 2020. However, due to contract and transmission limitations, not all of this new electricity will be available in time. Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

As shown in **Table B-7**, state reduction efforts are anticipated to reduce business-as-usual emissions by 146,400 MTCO₂e in 2020 and 225,200 MTCO₂e in 2035. The majority of these reductions are from the AB 1493 (Pavley) standards and PG&E’s Renewable Portfolio Program. In comparison to the business-as-usual scenario, 2020 emissions with state reduction measures are 9% below baseline 2005 levels rather than 10% above. Similarly, 2035 emissions go from 20% above baseline 2005 levels in the business-as-usual scenario to 9% below baseline levels after state efforts are taken into account.

TABLE B-7 – SUMMARY OF GHG FORECAST ADJUSTED FOR STATE ACTIONS

| | 2020 | 2035 |
|-----------------------------------------------------|----------|----------|
| Business-as-Usual Emissions | 860,800 | 934,300 |
| California Green Building Standards Code (CalGreen) | -4,500 | -13,300 |
| AB 1493 (Pavley) Vehicle Standards | -130,700 | -194,700 |
| California Solar Initiative (CSI) | -300 | -200 |
| California’s Renewable Portfolio Standard (RPS) | -10,900 | -17,000 |
| Subtotal of State Reduction Efforts* | -146,400 | -225,200 |
| Net Emissions* | 714,400 | 709,000 |
| Percent Change from 2005 | -9% | -9% |

* Due to rounding, the total may not be the sum of component parts.

V. GHG REDUCTION TARGETS

The next step is for the County to determine GHG reduction targets for 2020 and 2035. The BAAQMD CEQA Guidelines direct local governments to establish a GHG reduction target for 2020 and for the target year of the document, which in San Mateo County’s case is 2035. The new GHG reduction targets will be the goal of the Energy Efficiency Climate Action Plan and a way of measuring the Plan’s success.

STATE-RECOMMENDED 2020 AND 2035 REDUCTION TARGETS

The County's GHG reduction target at minimum should be consistent with the GHG reduction target adopted by the State through the Global Warming Solutions Act (AB) 32. AB 32 calls for statewide GHG emissions to return to 1990 levels by 2020. The AB 32 Scoping Plan identifies local governments as "essential partners" in achieving this target and identifies 15% below current (2005–2008) levels as the local government equivalent of 1990 GHG emission levels.

The State has not adopted GHG reduction targets beyond 2020; however, in 2005, then-Governor Schwarzenegger signed Executive Order S-3-05, which created a goal to reduce GHG emissions to 1990 levels by 2020 and to 80% below 1990 levels by 2050. An 80% reduction below 1990 levels is equivalent to a 95% reduction below 2005 levels by 2050. These state targets also satisfy also BAAQMD's CEQA compliance guidelines.

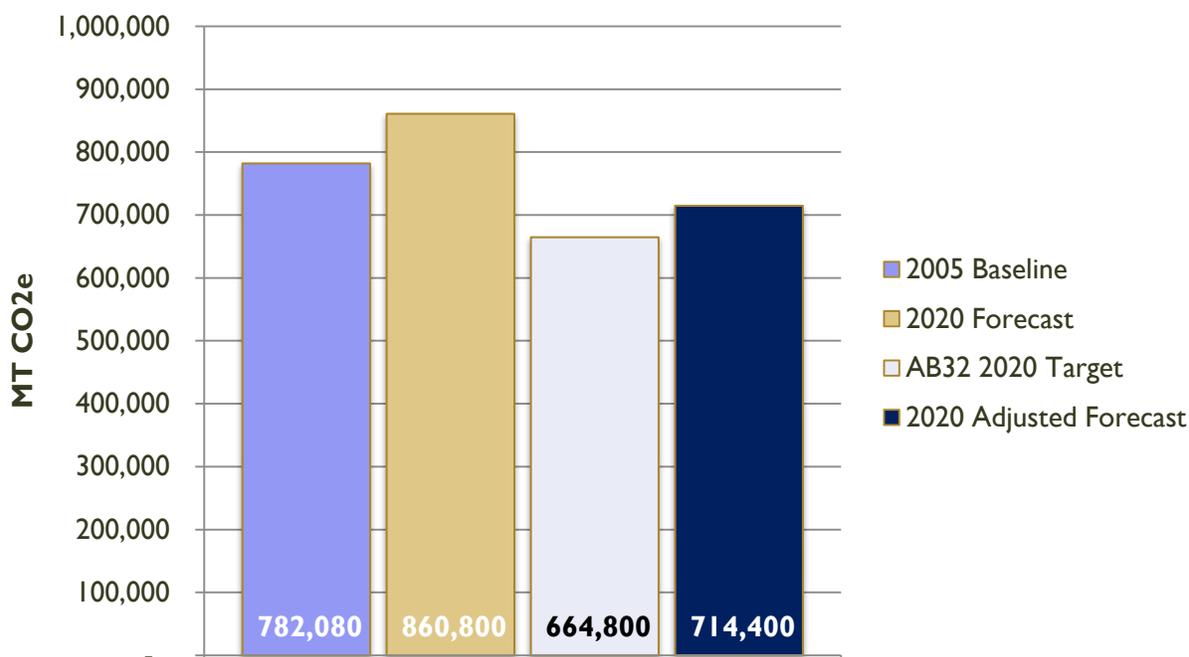
As shown in **Table B-8**, the County would need to facilitate a 7% reduction in emissions to meet the AB 32 Scoping Plan goal of 15% below 2005 levels by 2020. Similarly, to be on a trajectory toward the Executive Order S-3-05 target for 2050, the County would need to reduce emissions by approximately 50% by 2035.

TABLE B-8 – SAN MATEO COUNTY GHG EMISSIONS & STATE REDUCTION TARGETS

| | 2005 | 2020 | 2035 |
|-------------------------------------------------|---------|---------|---------|
| San Mateo Adjusted Business-as-Usual Forecast | 782,080 | 714,400 | 709,000 |
| State Reduction Targets | 782,080 | 664,800 | 351,900 |
| Local Reduction Necessary to Meet State Targets | 0% | 7% | 50% |

Figure B-10 shows the County's reduction forecasts in relation to baseline and state reduction targets. The County's business-as-usual forecast is shown in blue, baseline emissions are in red, the adjusted business-as-usual forecast (with state reductions) is in green, and state recommended targets are in purple.

FIGURE B-10 – SAN MATEO COUNTY FORECAST SUMMARY AND REDUCTION TARGETS



VI. CONCLUSION AND NEXT STEPS

The Inventory is an important milestone for the entire community in assessing and mitigating its impact on climate change from the activities of the people, businesses, and industry in San Mateo County. The Inventory also provides data that will shape the development of the EECAP. This Inventory will provide a justifiable basis for the County’s analysis of its impact on climate change. The next step will be for the County to review and confirm Inventory findings and determine how the community will achieve the desired 2020 GHG reduction target through development of the EECAP.

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ATTACHMENTS:

- B1: San Mateo County Transportation Baseline and Future Year Inventory Fehr & Peers.
- B2: Adjusted Business As usual Forecast Summary: State Reduction Efforts

ATTACHMENT B1: SAN MATEO COUNTY TRANSPORTATION BASELINE AND FUTURE YEAR INVENTORY, FEHR & PEERS.

Date: July 6, 2011

From: Ben Larson and Tien-Tien Chan, Fehr & Peers

Subject: *San Mateo County Transportation Baseline and Future Year Inventory*

SF11-0557

This technical memorandum documents the base year and future year VMT estimated by Fehr & Peers as part of the San Mateo County Climate Action Plan. The C/CAG (San Mateo County) Travel Demand Model was used to develop the VMT estimates. This memo consists of the following sections:

1. Base Year (2005) VMT Estimates
2. Future Year (2035) VMT Estimates
3. Future Year (2020) VMT Estimates
4. Future Year (2050) VMT Estimates

BASE YEAR (2005) VMT ESTIMATES

Fehr & Peers conducted a model run to calculate base year daily VMT by speed bin estimates. Using select link analysis, three types of vehicle trips were tracked separately for AM and PM peak periods for the unincorporated San Mateo County:

- Vehicle trips that remained internal to the location.
- Vehicle trips with one end in the location and one end outside of location (IX/XI trips).
- Vehicle trips with neither end in the location (XX trips).

Using the set of “accounting rules” recommended for VMT inventories in Climate Action Plans by the Bay Area Regional Transportation Advisory Committee (RTAC), VMT from trips of type 1, 2 and 3 were counted 100%, 50%, and 0% respectively towards jurisdiction-generated VMT.

The C/CAG model is calibrated to AM and PM peak period conditions. These volumes were then converted into daily trips based on analysis of District 4 PeMS data which indicates that 50% of the daily traffic on state highways in the Bay Area travel during the AM and PM peak periods. An estimate for daily volumes was calculated with the following equation: $\text{daily VMT} = (\text{AM VMT} + \text{PM VMT}) * 2$. Table B1-1 shows the 2005 Baseline VMT estimates by speed bin. See Appendix B1-A for XX VMT estimates.

| Speed | | Peak | Daily |
|--------------|-----------|------------------|------------------|
| From | To | | |
| 0 | 5 | 0 | 0 |
| 5 | 10 | 10,621 | 21,243 |
| 10 | 15 | 1,617 | 3,234 |
| 15 | 20 | 16,770 | 33,539 |
| 20 | 25 | 12,447 | 24,895 |
| 25 | 30 | 39,352 | 78,705 |
| 30 | 35 | 132,199 | 264,398 |
| 35 | 40 | 165,938 | 331,876 |
| 40 | 45 | 39,411 | 78,821 |
| 45 | 50 | 12,698 | 25,395 |
| 50 | 55 | 6,527 | 13,055 |
| 55 | 60 | 77,057 | 154,114 |
| 60 | 65 | 542,167 | 1,084,334 |
| 65 | + | 161,299 | 322,599 |
| Total | | 1,218,104 | 2,436,209 |

Fehr & Peers, 2011.

FUTURE YEAR VMT ESTIMATES

Fehr & Peers ran the 2035 C/CAG model and obtained a Year 2035 VMT estimate, representing the future VMT. The 2020 forecast was subsequently calculated by linearly interpolating between the 2005 base year results and the 2035 results. The 2050 forecast was subsequently calculated by linearly extrapolating from 2035. Tables B1-2, B1-3, and B1-4 show the result of these runs.

These tables show that VMT for the County would increase by:

- 6 percent from year 2005 to year 2020
- 11 percent from year 2005 to year 2035
- 17 percent from year 2005 to year 2050

| Speed | | Peak | Daily |
|--------------|----|------------------|------------------|
| From | To | | |
| 0 | 5 | 667 | 1,334 |
| 5 | 10 | 7,060 | 14,120 |
| 10 | 15 | 10,737 | 21,474 |
| 15 | 20 | 5,365 | 10,729 |
| 20 | 25 | 7,797 | 15,593 |
| 25 | 30 | 55,849 | 111,699 |
| 30 | 35 | 133,613 | 267,226 |
| 35 | 40 | 167,302 | 334,604 |
| 40 | 45 | 43,650 | 87,299 |
| 45 | 50 | 14,080 | 28,160 |
| 50 | 55 | 4,734 | 9,468 |
| 55 | 60 | 95,105 | 190,210 |
| 60 | 65 | 631,280 | 1,262,560 |
| 65 | + | 179,984 | 359,968 |
| Total | | 1,357,221 | 2,714,443 |

Fehr & Peers, 2011.

| Speed | | AM Peak | | PM Peak | | Peak | Daily |
|-------|----|---------|--------|---------|--------|---------|---------|
| From | To | II | IXXI | II | IXXI | | |
| 0 | 5 | 0 | 105 | 0 | 228 | 333 | 667 |
| 5 | 10 | 0 | 78 | 0 | 8,762 | 8,841 | 17,681 |
| 10 | 15 | 0 | 2,975 | 0 | 3,202 | 6,177 | 12,354 |
| 15 | 20 | 0 | 1,554 | 0 | 9,513 | 11,067 | 22,134 |
| 20 | 25 | 0 | 5,183 | 0 | 4,939 | 10,122 | 20,244 |
| 25 | 30 | 399 | 15,138 | 1,235 | 30,829 | 47,601 | 95,202 |
| 30 | 35 | 3,126 | 53,321 | 5,522 | 70,937 | 132,906 | 265,812 |
| 35 | 40 | 7,583 | 66,039 | 14,162 | 78,836 | 166,620 | 333,240 |
| 40 | 45 | 978 | 16,797 | 1,575 | 22,180 | 41,530 | 83,060 |
| 45 | 50 | 749 | 5,641 | 971 | 6,028 | 13,389 | 26,778 |

**Table B1-3
2020 VMT Estimates by Speed Bin**

| Speed | | AM Peak | | PM Peak | | Peak | Daily |
|--------------|----|---------------|----------------|---------------|----------------|------------------|------------------|
| From | To | II | IXXI | II | IXXI | | |
| 50 | 55 | 0 | 2,483 | 0 | 3,147 | 5,631 | 11,261 |
| 55 | 60 | 0 | 36,071 | 0 | 50,009 | 86,081 | 172,162 |
| 60 | 65 | 6,172 | 257,636 | 7,713 | 315,204 | 586,724 | 1,173,447 |
| 65 | + | 5,793 | 81,708 | 6,039 | 77,102 | 170,642 | 341,283 |
| Total | | 24,800 | 544,728 | 37,216 | 680,918 | 1,287,663 | 2,575,326 |

**Table B1-4
2050 VMT Estimates by Speed Bin**

| Speed | | Peak | Daily |
|--------------|----|------------------|------------------|
| From | To | | |
| 0 | 5 | 1,000 | 2,001 |
| 5 | 10 | 5,279 | 10,558 |
| 10 | 15 | 15,297 | 30,594 |
| 15 | 20 | 4,110 | 8,220 |
| 20 | 25 | 5,471 | 10,942 |
| 25 | 30 | 64,098 | 128,195 |
| 30 | 35 | 134,320 | 268,640 |
| 35 | 40 | 167,984 | 335,969 |
| 40 | 45 | 45,769 | 91,538 |
| 45 | 50 | 14,771 | 29,542 |
| 50 | 55 | 3,837 | 7,675 |
| 55 | 60 | 104,129 | 208,258 |
| 60 | 65 | 675,836 | 1,351,672 |
| 65 | + | 189,326 | 378,653 |
| Total | | 1,431,228 | 2,862,455 |

Fehr & Peers, 2011.

DETAILED VMT COMPARISON

The detailed results from the year 2035 run, see Table B1-5, show that internal-internal (II) daily VMT has a net decrease from year 2005 while the internal-external (IX/XI) daily VMT has a net increase from year 2005.

A potential reason for the decrease in internal-internal trips could be related to employment increase within the unincorporated County compared to the rest of the County. The unincorporated County shows a net employment increase of 37 percent compared to a 53 percent increase in the rest of the County. Unincorporated County residences may be shifting jobs from within the unincorporated County to outside the unincorporated County, thus decreasing internal-internal trips and increasing internal-external trips.

| | Year 2005 | Year 2035 | Difference |
|------------------------------------|-----------|-----------|------------|
| Internal-Internal (II) Daily VMT | 130,557 | 117,510 | -10% |
| Internal-External (IXXI) Daily VMT | 2,305,651 | 2,596,933 | 13% |
| Employment - Unincorporated | 46,379 | 63,759 | 37% |
| Employment - Incorporated | 292,201 | 446,670 | 53% |

Fehr & Peers, 2011.

GHG ANALYSIS

After obtaining VMT estimates by speed bin, we post-processed the numbers to convert to estimated CO₂ emissions. Emissions factors were obtained from EMFAC for year 2005, 2020, 2035, and 2040¹⁴ for San Mateo County. Our previous research with the emissions factors has also shown some error in the EMFAC factors for speeds in excess of 65mph. These results must be interpreted cautiously. EPA factors were utilized to convert from CO₂ to CO₂e emissions. Table B1-6 shows the estimated annual CO₂e emissions for base year 2005, 2020, 2035, and 2050.

| | 2005 | 2020 | 2035 | 2050 |
|-------------------------|---------|---------|---------|---------|
| CO ₂ e | 393,527 | 413,015 | 433,348 | 460,418 |
| Increase from Year 2005 | -- | 5% | 10% | 17% |

Fehr & Peers, 2011.

¹⁴ Year 2050 emissions were not available for EMFAC.

Appendix B1-A

| Table B1-7 | | | |
|--------------------------------------------------------------|-----------|----------------|----------------|
| 2005 External-External(XX) VMT Estimates by Speed Bin | | | |
| Speed | | Peak | Daily |
| From | To | | |
| 0 | 5 | 0 | 0 |
| 5 | 10 | 0 | 0 |
| 10 | 15 | 0 | 0 |
| 15 | 20 | 320 | 641 |
| 20 | 25 | 1,758 | 3,517 |
| 25 | 30 | 32,288 | 64,575 |
| 30 | 35 | 29,593 | 59,185 |
| 35 | 40 | 101,210 | 202,420 |
| 40 | 45 | 33,132 | 66,264 |
| 45 | 50 | 109 | 219 |
| 50 | 55 | 0 | 0 |
| 55 | 60 | 0 | 0 |
| 60 | 65 | 0 | 0 |
| 65 | + | 0 | 0 |
| Total | | 198,411 | 396,821 |

Fehr & Peers, 2011.

APPENDIX B: BASELINE GHG INVENTORY

ATTACHMENT B2: ADJUSTED BUSINESS AS USUAL FORECAST SUMMARY - STATE REDUCTION EFFORTS.

ADJUSTED BUSINESS AS USUAL FORECAST SUMMARY: STATE REDUCTION EFFORTS

Actions and legislation implemented by the State of California will have significant impact on reducing San Mateo County's GHG emissions. State programs are included in the adjusted business-as-usual forecast to determine the additional level of local efforts that will be needed to meet the State-recommended GHG reduction targets of 15% below baseline levels by 2020.

Figure B2-1: Summary of State GHG Reduction Impacts to Unincorporated San Mateo County

| | 2020 | 2035 |
|------------------------------------------------------------|----------|----------|
| Business-as-Usual Emissions | 860,800 | 934,300 |
| California Green Building Standards Code (CalGreen) | -4,500 | -13,300 |
| AB 1493 (Pavley) Vehicle Standards | -130,700 | -194,700 |
| California Solar Initiative (CSI) | -300 | -200 |
| California's Renewable Portfolio Standard (RPS) | -10,900 | -17,000 |
| Subtotal of State Reduction Efforts* | -146,400 | -225,200 |
| Net Emissions* | 714,400 | 709,000 |
| Percent Change from 2005 | -9% | -9% |

ASSEMBLY BILL (AB) 1493 (PAVLEY)

Method

Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency (EPA) granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

The Pavley rules establish GHG emission standards for two different groups of passenger vehicles: (1) passenger cars (PC) and light duty trucks with test weights under 3,751 pounds loaded vehicle weight (LDT1); and (2) light-duty trucks with test weights between 3,751 pounds loaded vehicle weight and 8,500 pounds gross vehicle weight (GVW) (LDT2). Medium-duty passenger vehicles (LDT3) between 8,500 and 10,000 pounds GVW are included with manufacturers' LDT2 vehicles when determining compliance with

California's GHG standards. For the purposes of this analysis, only vehicles up through 8,500 pounds were considered, since the majority of LDT3 vehicles are commercial and therefore do not fall under the scope of the Pavley rules.

The GHG emission standards established by the Pavley regulation reflect not only exhaust CO₂ emissions resulting directly from operation of the vehicle but also (1) tailpipe emissions of CH₄ and N₂O; (2) CO₂ emissions resulting from operating the air conditioning system (indirect AC emissions); and (3) HFC refrigerant emissions released from the air conditioning system due to leakage, losses during recharging, sudden releases due to accidents, or release from scrapping of the vehicle at end of life (direct AC emissions). In this analysis, we are only accounting for CO₂ from tailpipe. Air conditioning is not included in EMFAC estimates of CO₂e and methane and therefore not accounted for in the reductions.

GHG reductions from the Pavley standard were calculated using EMFAC 2007 data for Contra Costa County. EMFAC 2007 data includes the breakdown of vehicles by vehicle class and emissions factors per mile for each vehicle class. The impact that the Pavley Standard will have on passenger vehicles in San Mateo County follows the method included in an EMFAC2007 post-processing tool provided by the California Air Resources Board. Emissions reductions per model year and vehicle class were applied to San Mateo County's transportation emissions and will result in a 26% decrease in transportation related GHG emissions by 2020 and a 36% decrease by 2035.

Citations

California Air Resources Board. 2006. Emissions Factor 2007 Model Software. http://www.arb.ca.gov/msei/onroad/latest_version.htm

———. 2010. Clean Car Standards - Pavley, Assembly Bill 1493. <http://www.arb.ca.gov/cc/ccms/ccms.htm>.

———. 2010. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.

RENEWABLE PORTFOLIO STANDARD

Method

California's Renewable Portfolio Standard (RPS) mandates that utility providers procure 33% of their energy from renewable sources by 2020. PG&E is the provider of electricity in San Mateo County, and approximately 11.7% of the utility's electricity came from qualified renewable sources in 2005. In 2010, PG&E maintained a portfolio with 17.7% of their total electricity sales coming from certified renewable energy sources. While PG&E has made significant strides to reach the 33% goal by 2020, the California Public Utilities Commission (CPUC) has indicated that energy providers are not likely to meet this target due to transmission and permitting issues that have proved to be significant barriers to the development of renewable energy. The implementation of RPS in this Plan estimates PG&E will be providing customers in San Mateo County with 28% of their electricity from renewable sources by 2020 and 35% by 2035.

Citations

California Public Utilities Commission. 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.

———. 2011. California Renewable Portfolio Standard. Sacramento, CA. <http://www.cpuc.ca.gov/PUC/energy/Renewables/index.htm>

CALIFORNIA SOLAR INITIATIVE

Method

The California Solar Initiative (CSI) was authorized in 2006 under Senate Bill (SB) 1 and allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities (IOUs): Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE). The CSI program has a budget of \$2.167 billion to be expended by 2016, with a goal to reach 1,940 megawatts (MW) of installed power throughout the state by that time. The CSI program has several components including the Research and Development, Single-family Affordable Solar Housing (SASH), Multi-family Affordable Solar Housing (MASH), and Solar Water Heating Pilot Program, each of which provides incentives to further the development and installation of new solar technology on California's buildings.

The CPUC provides complete solar installation data for each jurisdiction in California since 2006. GHG reductions related to the California Solar Initiative are incorporated into this Plan by identifying the total megawatts installed in the unincorporated county since the start of the program and estimating the annual kWh output of the solar installations. This calculation also estimates the rate at which residents and businesses will continue to install solar equipment through 2016, the anticipated end year of the program. Between 2006 and 2010, residential and commercial customers in the county installed approximately 300 kW of solar photovoltaic systems, estimated to generate approximately 475,000 kWh every year. By 2020, it is estimated that residents and businesses in the county will have installed 1 MW of renewable energy systems that will produce approximately 1.4 million kWh annually.

Citations

California Energy Commission and California Public Utilities Commission. 2010. About the California Solar Initiative. <http://www.gosolarcalifornia.org/about/csi.php>.

———. 2011. California Solar Initiative: California Solar Statistics – Geographical Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/

TITLE 24: ENERGY EFFICIENCY STANDARDS

Method

California Building Codes, Title 24

Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. The 2010 triennial edition Title 24 applies to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. The EECAP will focus on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code or CALGreen Code. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

Part 6, 2008 Building Energy Efficiency Standards

The most recent update to Title 24 Part 6, the California Energy Code, went into effect on January 1, 2010 for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.

Part 11, 2010 California Green Building Code

California is the first state in the nation to adopt a mandatory green building code, the California Green Building Standards Code, or CALGreen. The CALGreen Code was updated in 2010, and became a mandatory code beginning January 1, 2011. The Code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen code and may elect to adopt one of the two additional tiers. Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24 Part 6 standards. However, if a local government elects to adopt either of the tiers of CALGreen, additional prerequisites and electives must be implemented by new development projects subject to CALGreen. For the voluntary energy efficiency prerequisites, Tier 1 is a 15% improvement and Tier 2 is a 30% improvement over minimum Title 24 Part 6 requirements.

Adjustment to the Forecast for Mandatory Title 24 Reductions

The GHG forecast incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for on-going triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As

such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction. The County has adopted the minimum requirements of CALGreen.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction.

The AB 32 Scoping Plan calls for triennial updates to Title 24. To be conservative, we estimate that updated Title 24 standards will become effective every four years in 2010 (current version), 2014, 2018, and 2022. This analysis does not take into consideration any updates past 2022 due to lack of certainty.

Past updates to Title 24 have shown equal if not higher increases in efficiency as a result of the update. To be conservative, we estimate that each update to the Title 24 standards will have 70% of the effectiveness of the 2008 versus 2005 standards.

The energy impact of 2008 Title 24 standards for nonresidential alterations is modeled. Future updates to Title 24 standards for nonresidential alterations are not taken into consideration for lack of data and certainty.

Citations

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

———. 2010. 2009 California Residential Appliance Saturation Study. Sacramento, CA. <http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF>

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APPENDIX C: GHG METHODS AND ASSUMPTIONS



This technical appendix provides a summary of the data sources, assumptions, and performance metrics used in this Energy Efficiency Climate Action Plan (EECAP) for the County of San Mateo to quantify estimated greenhouse gas (GHG) reductions. The sources and metrics are organized by policy and rely on four primary types of data and research: (1) the County's GHG emissions inventory and forecast, (2) government agency tools and reports, (3) case studies in similar jurisdictions, and (4) scholarly research.

The approach to quantification is consistent with the guidance provided by the Bay Area Air Quality Management District (BAAQMD) for the development of a Qualified GHG Reduction Strategy. Fehr & Peers lead the development and quantification of land use and transportation measures, based on their extensive involvement in projects developing and implementing projects based on SB 375 and Regional Target Advisory Committee protocols. KEMA developed tailored energy reduction measures, based on their experience preparing the draft Climate Action Plan template for C/CAG, in addition to their involvement in energy projects throughout the state. The project team worked together with PMC to develop and quantify tailored reduction measures for the County's EECAP, using transparent methodologies and tools.

The baseline GHG inventory and forecast serve as the foundation for the quantification of the County's GHG reduction measures. Activity data from the inventory forms the basis of measure quantification, including vehicle miles traveled, kilowatt-hours (kWh) of electricity or therms of natural gas consumed, and tons of waste disposed. Activity data was combined with the performance targets and indicators identified by the County and PMC staff. Together, the metrics of activity data and performance targets and indicators were used throughout the quantification process to calculate the GHG reduction benefit of each measure. This approach ensures that the County's GHG reductions are tied to the baseline and future activities that are actually occurring within the County of San Mateo. The approach to quantification is further described in **Chapter 4**.

1.1 Energy Upgrade California

Promote voluntary energy efficiency improvements through rebate programs, such as the Energy Upgrade California Program, and other similar programs as they become available.

Action Items:

- Gather information on program effectiveness, and use information to continue tailoring marketing to specific residential customers.
- Implement and expand the Reduce Before You Produce program and the residential Energy Action Program.

GHG Reductions:

| | |
|----------------------------|------------------------------------------------------------------------------------------------------------|
| 2020: | 2,910 MTCO ₂ e |
| 2035: | 6,300 MTCO ₂ e |
| Community Costs: | High |
| Community Savings: | High |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Housing, County Manager |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Reduces Water Consumption Supports Local Economy |
| 2020 Performance Targets: | Participation of 36% of households (8,235) in the program |
| 2035 Performance Targets: | Participation of 82% of households (19,464) in the program |

Assumptions:

Use PG&E overall residential energy efficiency savings goals for 2010–2012 and estimate the proportion of energy savings in the unincorporated county based on the unincorporated county's percentage of households in the PG&E territory. Use estimated energy savings for the unincorporated county and estimate participation rates. Calculate energy and cost savings beginning in 2010. Assume annual energy reduction goals in 2020–2035 are 30% less than the annual goals in earlier years.

Sources:

PG&E EEGA Monthly report (Based on Compliance Filings by Target Market)

1.2 Residential Energy Efficiency Financing

Research and promote innovative financing opportunities for residential energy efficiency upgrades to achieve 30% average household energy savings.

Action Items:

- Research various options, including on-bill financing or “green mortgages,” for financing energy efficiency projects.
- Work with landlords to develop and promote green leases, and work with financial institutions to develop and promote green mortgages.
- Develop targeted marketing campaign to residents.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------------------|
| 2020: | 810 MTCO ₂ e |
| 2035: | 1,910 MTCO ₂ e |
| Community Costs: | High |
| Community Savings: | Medium-High |
| Implementation Time Frame: | Near-Term (Between 2011 and 2015) |
| Responsible Agencies: | Planning & Building, Housing |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Provides Educational Opportunities Provides Community Savings Reduces Energy Demand |
| 2020 Performance Targets: | Participation of 3% of households (690) by 2020, each achieving 30% in energy savings |
| 2035 Performance Targets: | Participation of 7% of households (1,670) by 2020, each achieving 30% in energy savings |

Assumptions:

Assume that each participating household or business will achieve a 30% reduction in energy in comparison to BAU trends to calculate energy and cost trends. Household energy consumption based on forecast residential energy consumption. Assume 30% energy savings per household participating to calculate energy and cost savings.

Sources:

US Department of Energy and US Department of Housing and Urban Development. 2010. Memorandum of Understanding Regarding Building Energy Programs and Energy Efficient Mortgages. http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/ns/hud_doe_mou.pdf.

Energy Upgrade California (data provided by County).

1.3 Low-Income Weatherization

Perform outreach to eligible low-income residents to encourage participation in federally funded weatherization programs

Action Items:

- Research target residents, such as the low-income community in North Fair Oaks.
- Develop and implement a targeted marketing campaign.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------------------|
| 2020: | 1,460 MTCO ₂ e |
| 2035: | 1,470 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | High |
| Implementation Time Frame: | Near-Term (Between 2011 and 2015) |
| Responsible Agencies: | Housing, Planning & Building, in partnership with El Concilio of San Mateo County |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Provides Educational Opportunities |
| 2020 Performance Targets: | Participation of 1,632 eligible households (25%) by 2030 |
| 2035 Performance Targets: | Participation of 1,691 eligible households (25%) by 2035 |

Assumptions:

Assume energy cost savings of \$400/year per home and calculate expected energy reduction based on current energy rates. Also calculate the associated cost savings in 2020 and 2035, based on projected energy rates for 2020 and 2035.

Sources:

California Department of Community Service and Development. 2007. Weatherization Facts and Figures. <http://www.csd.ca.gov/Programs/Weatherization%20Facts%20and%20Figures.aspx?PageView=Shared>.

1.4 Tree Planting

Incentivize or encourage appropriate tree planting near buildings to reduce heat gain and loss and to sequester greenhouse gases.

Action Items:

- Review other counties' tree planting programs, and determine whether to implement an incentive program and/or an educational campaign.
- Collaborate with local environmental or community organizations to fund program costs or provide outreach.
- Identify and promote desirable tree types and locations for plantings to minimize impact of root systems on infrastructure

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------------------------------|
| 2020: | 450 MTCO ₂ e |
| 2035: | 910 MTCO ₂ e |
| Community Costs: | High |
| Community Savings: | Medium-High |
| Implementation Time Frame: | Near-Term (Between 2012 and 2015) |
| Responsible Agencies: | Planning & Building, Housing, Public Works, Parks |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Promotes Equity Improves Public Health |
| 2020 Performance Targets: | Participation of 2,300 homes (10%) in project |
| 2035 Performance Targets: | Participation of 4,770 homes (20%) in project |

Assumptions:

Assume that households participating in tree plantings to shade buildings achieve a 5% energy savings. The community costs assume that each participating family purchases two \$250 trees. Annual savings are based on energy savings and projected energy rates in 2020 and 2035.

Sources:

Heat Island Group. 2001. Energy Impacts of Heat Island Reduction strategies in the Greater Toronto Area, Canada. http://www.epa.gov/heatisland/resources/pdf/toronto_energysavings.pdf (as cited in the C/CAG paper).

1.5 Propane Switch

Incentivize or encourage residents to switch from propane heaters to more energy efficient options, such as Energy Star furnaces or electric air-source heat pumps (ASHPs).

Action Items:

- Gather information on the use of propane in the unincorporated county, and provide incentives and/or educational material regarding switching from propane heaters to alternatives.
- Update building and planning permit forms to request information on propane heating and allow staff to encourage more energy efficient alternatives

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | High |
| Community Savings: | Medium-High |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Provides Community Savings |
| 2020 Performance Targets: | Number of propane heaters replaced with more efficient models |
| 2035 Performance Targets: | Number of propane heaters replaced with more efficient models |

Assumptions:

N/A

Sources:

N/A

2.1 Commercial and Industrial Efficiency

Promote and potentially further incentivize third-party programs for commercial and industrial energy efficiency, such as the Commercial Industrial Boiler Efficiency Program.

Action Items:

- Gather information on program effectiveness, and use information to tailor marketing to specific groups.
- Promote third-party incentive programs, including the Commercial Industrial Boiler Efficiency Program, Air Care Plus, and LodgingSavers.
- Implement and expand various energy efficiency rebate and incentive programs, such as San Mateo County Energy Watch and the Right Lights Program.
- Identify top energy users of the commercial market to target for benefit from promotion efforts.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------------------------------------|
| 2020: | 2,800 MTCO ₂ e |
| 2035: | 4,610 MTCO ₂ e |
| Community Costs: | High |
| City Savings: | High |
| Implementation Time Frame: | Ongoing |
| Responsible Partners: | C/CAG, PG&E |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Supports Local Economy Improves Public Health |
| 2020 Performance Targets: | Participation of 788 businesses |
| 2035 Performance Targets: | Participation of 2,167 businesses |

Assumptions:

Assume an increase in natural gas savings goals due to the County's increased marketing of third-party programs that specifically focus on reducing natural gas. Assume that each business participating in the program will reduce energy usage by 30%. Assume this carries forward to 2035, and also assume energy and

cost savings began in 2010. The calculation regarding participation rates is based on the number of service accounts, then prorated to the number of businesses.

Sources:

Amann, Jennifer Thorne, and Eric Mendelsohn. 2005. Comprehensive Commercial Retrofit Programs: A Review of Activity and Opportunities. Report Number A025. Prepare for American Council for an Energy-Efficient Economy.

http://www.energystar.gov/ia/partners/rep/ci_program_sponsors/downloads/Comprehensive_Commercial_Retrofit_Programs.pdf.

California Public Utilities Commission (CPUC). 2010. PG&E 2196 PIP. <http://eega.cpuc.ca.gov/Main2010PIPs.aspx>.

2.2 Commercial Financing

Research and promote innovative financing opportunities for commercial energy efficiency upgrades.

Action Items:

- Research various options, such as CaliforniaFIRST Property Assessed Clean Energy, on-bill financing, or “green mortgages,” for financing energy efficiency projects.
- Work with landlords to develop and promote green leases, and work with financial institutions to develop and promote green mortgages

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------|
| 2020: | 1,710 MTCO ₂ e |
| 2035: | 4,590 MTCO ₂ e |
| Community Costs: | High |
| Community Savings: | High |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Planning & Building, with other departments to be determined |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand |
| | Provides Community Savings |
| | Supports Local Economy |
| 2020 Performance Targets: | Participation of 93 businesses |
| 2035 Performance Targets: | Participation of 253 businesses |

Assumptions:

Assume 30% energy savings per business participating to calculate energy and cost savings. (Cost savings are also based on forecasted energy rates in 2020.)

Sources:

State of New York Public Service Commission. 2008. Case 07-M-0548 – Proceeding on Motion of the Commission. Regarding an Energy Efficiency Portfolio Standard (EEPS) Working Group VI – On-Bill Financing Final Report. <http://www.ma-eeac.org/docs/091216-OBf-NYreport.pdf>.

EnergyStar. 2012. Energy Efficient Mortgages. http://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages.

Department of Housing and Urban Development. 2011. Energy Efficient Mortgage Home Owner Guide. http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/eem/eemhog96.

US Department of Energy. 2011. Energy Savers. http://www.energysavers.gov/your_home/designing_remodeling/index.cfm/mytopic=10380.

2.3 Institutional Energy Efficiency

Facilitate energy efficiency in large institutional energy users, including golf courses, airports, and schools.

Action items:

- Assess and target businesses with significant opportunities for improvements, including some of the unincorporated county’s largest energy users, such as airports, manufacturing uses, country clubs, and golf courses.
- Research and promote high-impact energy efficiency options, target key institutions, and develop partnerships to implement new projects.
- Promote opportunities for energy audits and upgrades through the County’s website and additional outreach efforts.
- Target outreach efforts to institutions with high natural gas usage specifically to promote market programs designed to reduce natural gas consumption.

GHG Reductions:

2020: 11,070 MTCO_{2e}

2035: 34,290 MTCO_{2e}

Community Costs: High

City Savings: High

Implementation Time Frame: Near-Term (Between 2011 and 2015)

Responsible Agencies: Planning & Building with other departments to be determined

Applicability: Existing Development

| | |
|---------------------------|------------------------------------------------------------------------------------------|
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Supports Local Economy |
| 2020 Performance Targets: | Participation of 10 large institutional businesses such as golf courses or country clubs |
| 2035 Performance Targets: | Participation of 20 large institutional businesses such as golf courses or country clubs |

Assumptions:

Assume the energy savings achieved in recent years by SFO is similar to what can be achieved by a group of other institutions in the unincorporated county by 2035 and back-calculate the energy savings in 2020. Costs are assumed to be high due to the type of energy efficiency upgrades that will be required.

Sources:

San Francisco International Airport. 2010. SFO Climate Action Plan. <http://www.flysfo.com/downloads/SFOClimateActionPlan2010.pdf>.

2.4 Green Business Program

Participate in the County Green Business Program to encourage sustainability and energy efficiency in businesses throughout the unincorporated county.

Action Items:

- Research the possibility of beginning a licensing program for businesses and the feasibility of participating in the Green Business Program, which identifies standards for energy efficiency, waste, and sustainability.
- Promote opportunities for businesses “greening” through local chambers of commerce and other partners.

GHG Reductions:

| | |
|----------------------------|------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Public Works, Planning |
| Applicability: | Existing Development |
| Mandatory or Voluntary: | Voluntary |

| | |
|---------------------------|------------------------------------------------------|
| Community Benefits: | Supports Local Economy Protects Natural Resources |
| 2020 Performance Targets: | Number of certified green businesses |
| 2035 Performance Targets: | Number of certified green businesses |

Assumptions:

N/A

Sources:

N/A

2.5 Implement AB 1103

Support energy benchmarking of the nonresidential sector to help business owners identify opportunities for energy improvements.

Action Items:

- Perform outreach and training to building owners, managers, and landlords regarding energy benchmarking and ongoing energy management. These efforts will help businesses comply with AB 1103, which requires nonresidential buildings to benchmark energy usage and disclose energy usage information upon the sale, lease, or financing of the entire building.
- Promote energy management and monitoring tools and free training opportunities provided by entities such as PG&E through the County’s website and publications.
- Provide materials to encourage business participation in energy monitoring programs through PG&E or programs such as the Energy Star Portfolio Manager (EPSM) to help businesses understand and track the impact of appliances on energy use.

GHG Reductions:

| | |
|----------------------------|-----------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low-Medium |
| Community Savings: | Low-Medium |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Public Works, Planning & Building |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand |

| | |
|---------------------------|------------------------------------------------------------------|
| | Provides Educational Opportunities |
| | Provides Community Savings |
| 2020 Performance Targets: | Number of businesses participating in energy management programs |
| 2035 Performance Targets: | Number of businesses participating in energy management programs |

Assumptions:

N/A

Sources:

N/A

3.1 Green Building Ordinance

Strengthen the energy efficiency requirements of the existing Green Building Ordinance, with appropriate outreach to stakeholders.

Action items:

- Maintain alignment with current state policies, regulations, and proposed legislation.
- Train staff as needed to ensure compliance with code provisions.
- Through the Green Building Ordinance update, work with stakeholders to expand the requirements of energy efficiency for new development to achieve compliance with CALGreen Tier 1 energy efficiency standards.

GHG Reductions:

| | |
|----------------------------|------------------------------|
| 2020: | 310 MTCO ₂ e |
| 2035: | 800 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Medium-High |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Housing, Planning & Building |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Reduces Energy Demand |
| | Provides Community Savings |
| | Reduces Water Use |
| | Improves Air Quality |

2020 Performance Targets: Participation of 2% of new homes and 5% of new businesses

2035 Performance Targets: Participation of 3% of new homes and 9% of new businesses

Assumptions:

Assume the Green Building Ordinance update will achieve a 15% energy reduction for all new participating buildings. Community costs assume small up-front additional costs during the building phase. Assume total energy savings based on average energy intensities (in energy use/square foot).

Sources:

California Department of Building Standards. 2010. Guide to the (Non-Residential) California Green Building Standards Code. <http://www.documents.dgs.ca.gov/bsc/CALGreen/Master-CALGreen-Non-Res-Guide2010-sec-ed-final-3-1-11.pdf>.

3.2 Green Building Incentives

Provide additional incentives to promote voluntary green building practices.

Action Items:

- Investigate the potential to set up revolving loan funds for green building projects.
- Identify additional incentives to encourage voluntary energy efficiency in projects not subject to the Green Building Ordinance, including commercial and industrial projects smaller than 3,000 square feet.

GHG Reductions:

2020: 6,460 MTCO₂e

2035: 68,440 MTCO₂e

Community Costs: Low-Mid

Community Savings: Medium-High

Implementation Time Frame: Mid-Term (5–10 Years)

Responsible Agencies: Planning & Building, Housing

Applicability: New & Existing Development

Mandatory or Voluntary: Voluntary

Community Benefits: Reduces Energy Demand

Improves Air Quality

Provides Community Savings

2020 Performance Targets: Participation of new 550 households and 75 new businesses

2035 Performance Targets: Participation of 5,550 households and 832 businesses

Assumptions:

Assume that 20% of residences and businesses are targeted for a marketing campaign, and of the target market, 3% participate in the program. Calculate energy and cost savings based on an assumed reduction in energy use of 15%. Community and County costs will vary depending on the program's design.

Sources:

California Energy Commission (CEC). 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF.

US Department of Energy. 2008. Energy Efficiency Trends in Residential and Commercial Buildings. http://apps1.eere.energy.gov/buildings/publications/pdfs/corporate/bt_stateindustry.pdf.

3.3 Urban Heat Island

Require tree planting, shading design, solar orientation, and “cool” hardscapes.

Action Items:

- Require areas with hardscape design to integrate shading, “cool” surfaces design, and open-grid paving.
- Require tree planting, shading design, solar orientation, “cool” hardscapes, and open-grid paving that reduces hardscape through strategies such as the use of interlocking concrete pavement, stones, or blocks.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------------------------------|
| 2020: | <20 MTCO ₂ e |
| 2035: | 20 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Mid-Term (No later than 2020) |
| Responsible Agencies: | Planning & Building, Housing |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Public Health Improves Air Quality Provides Community Savings Reduces Energy Demand |
| 2020 Performance Targets: | Participation of 145 households and 15 businesses |
| 2035 Performance Targets: | Participation of 1,231 households and 121 businesses |

Assumptions:

Assume that beginning in 2019, 100% of new construction projects will comply, which will yield a 3% reduction in residential peak demand and 6% reduction in commercial peak demand. Costs vary by project but are assumed to be low, since requirements will be known and applied during the design phase (these are one-time, upfront costs).

Sources:

EPA. 2011. Heat Island Effect. <http://www.epa.gov/heatisland/about/index.htm>.

Akbari, H. 2005. Energy Saving Potentials and Air Quality Benefits of Urban Heat Island Mitigation (PDF) (19 pp, 251K). Lawrence Berkeley National Laboratory. <http://www.osti.gov/bridge/purl.cover.jsp?purl=/860475-UIHWIq/860475.PDF>.

City of Sacramento. Tree shading requirements for parking lots. City Code 17.68.040. <http://www.qcode.us.codes/sacramento>.

3.4 Expedited Permitting

Expedite the review, permitting, and inspection process for projects targeting higher levels of energy reduction than mandated target goals or incorporating renewable energy systems

Action Items:

- Identify/remove regulatory barriers in the permit and CEQA process.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Near-Term (5–10 Years) |
| Responsible Agencies: | Planning and Building |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Supports Local Economy |
| 2020 Performance Targets: | Number of adopted incentives or code updates designed to streamline energy efficiency |
| 2035 Performance Targets: | Number of adopted incentives or code updates designed to streamline energy efficiency |

Assumptions:

N/A

Sources:

N/A

3.5 Efficiency Training & Outreach

Promote green building practices and develop community-wide capacity for energy efficiency in new construction.

Action Items:

- Provide information and education to the public and Building Department staff on best practices for green building, incentive/rebate programs available, and green building materials and techniques.
- Work with builders associations, the US Green Building Council, and other stakeholder groups to share green building resources.
- Use the County's Green Team to further promote green building.

GHG Reductions:

2020: Supportive Measure

2035: Supportive Measure

Community Costs: Low

City Savings: Low

Implementation Time Frame: Near-Term (0–5 Years)

Responsible Agencies: Planning & Building, Public Works, Public Library

Applicability: New & Existing Development

Mandatory or Voluntary: Voluntary

Community Benefits: Reduces Energy Demand
Provides Community Savings
Provides Educational Opportunities

2020 Performance Targets: Number of events, informational contacts, or materials produced to promote green building

2035 Performance Targets: Number of events, informational contacts, or materials produced to promote green building

Assumptions:

N/A

Sources:

N/A

3.6 Regional Energy Efficiency Efforts

Develop programs and incentives to promote large-scale community-wide partnerships for energy efficiency.

Action Items:

- Work with PG&E, local banks, nonprofits, and other local government jurisdictions to develop partnerships for implementation of a bulk purchase program.
- Create a neighborhood energy efficiency competition.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------|
| 2020: | 10 MTCO ₂ e |
| 2035: | 10 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Mid-Term (No later than 2020) |
| Responsible Agencies: | Planning & Building, Housing, Public Works |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Supports Local Economy Provides Community Savings Provides Educational Opportunities |
| 2020 Performance Targets: | Participation of 5% of households and 1% of businesses |
| 2035 Performance Targets: | Participation of 8% of households and 3% of businesses |

Assumptions:

Assume an 8% reduction in participating household and business energy use based on the results of similar programs implemented around the nation. Costs include staff time to organize the program and minor costs to the community to implement energy efficiency measures.

Sources:

Tallahassee – Leon County Council of Neighborhood Associations. Tallahassee Neighborhood Energy Challenge. http://www.econa.org/econa/page.html?page_id=34.

Garrison Institute. Climate, Cities, and Behavior Project. <http://www.garrisoninstitute.org/climate-and-behavior/climate-cities-and-behavior-project>.

New York State Energy Research and Development Authority (NYSERDA). NYSERDA Sponsored Energy Competition. <http://www.nysERDA.ny.gov/About/Newsroom/2011-Announcements/2011-11-21-Competition-to-Reduce-Energy-Use-Results-In-Savings-for-Six-Brooklyn-Neighborhoods.aspx>.

4.1 Solar PV Incentives

Provide incentives for small-scale solar PV systems less than 10 kW in size to encourage solar PV energy installations on existing development.

Action Items:

- Research potential incentives.
- Consider adoption of expedited permits for small-scale solar PV systems.
- Consider creation of a revolving loan fund for small-scale solar systems.
- Update the relevant ordinances and educate stakeholders regarding the change.

GHG Reductions:

| | |
|----------------------------|-----------------------------------------------------------------------------|
| 2020: | 100 MTCO ₂ e |
| 2035: | 410 MTCO ₂ e |
| Community Costs: | Low-Mid |
| Community Savings: | Medium |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works, Tax Collector/Treasurer/Revenue Services |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Air Quality Provides Community Savings Reduces Energy Demand |
| 2020 Performance Targets: | Installation of 73 residential PV systems and 18 commercial PV systems |
| 2035 Performance Targets: | Installation of 345 residential PV systems and 86 commercial PV systems |

Assumptions:

This measure will begin in 2017 as the California Solar Initiative (CSI) program is expected to end in 2016. It is assumed that this measure will continue with the same average installed capacity of PV systems per year as the CSI. Costs are assumed to be one-time costs associated with purchasing and installing the systems.

Sources:

California Energy Commission and California Public Utilities Commission. 2011. California Solar Initiative: California Solar Statistics - Geographical Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/.

California Energy Commission and California Public Utilities Commission. 2010. About the California Solar Initiative. <http://www.gosolarcalifornia.org/about/csi.php>.

4.2 Solar Water Heater Incentives

Provide incentives for solar water heaters and reduce/remove permit fees for solar hot water energy installations.

Action Items:

- Research potential incentives.
- Consider expedited permits, as well as a revolving loan fund.
- Update the relevant ordinances and educate stakeholders regarding the change.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------|
| 2020: | 100 MTCO ₂ e |
| 2035: | 470 MTCO ₂ e |
| City Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Mid-Term (No later than 2020) |
| Responsible Agencies: | Planning & Building, Public Works, Housing |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings |
| 2020 Performance Targets: | Installation of 27 residential SHW systems and 9 commercial SHW systems |
| 2035 Performance Targets: | Installation of 130 residential SHW systems and 43 commercial SHW systems |

Assumptions:

Assumes that participation rates will be lower than those in the solar PV program because solar water heaters may not be suitable for as many types of buildings as solar PV panels. Assumes an average energy use to heat water in California of 173 therms and an average amount of energy produced by solar water heaters of 130 therms. Costs are assumed to be one-time costs associated with purchasing and installing the systems.

Sources:

California Solar Energy Industry Association. 2009. The Value Proposition of Solar Water Heating In California. http://www.seia.org/galleries/pdf/CALSEIA_Report_SWH_Value_Proposition.pdf.

4.3 Pre-Wired Solar Homes

Require all new roofs to be pre-wired for solar PV and all new buildings to be plumbed for solar water heaters.

Action Items:

- Adopt a requirement for pre-wired solar through the Green Building Code update, which is a CALGreen voluntary elective measure (A5.211.4) for both Tier 1 and Tier 2

GHG Reductions:

| | |
|----------------------------|-----------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low-Mid |
| City Savings: | Low-Mid |
| Implementation Time Frame: | Mid-Term (5–10 years) |
| Responsible Agencies: | Planning & Building, Housing |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Provides Community Savings |
| 2020 Performance Targets: | Number of new roofs pre-wired for solar |
| 2035 Performance Targets: | Number of new roofs pre-wired for solar |

Assumptions:

N/A

Sources:

N/A

4.4 Pilot Solar Program

Encourage developers to offer solar PV and solar water heaters as a standard feature on a percentage of new homes in a development and as an upgrade for redevelopment projects in residential and commercial projects.

Action Items:

- Encourage pilot program consideration, and provide an expedited permit process and reduced fees for developers.

- After the pilot, conduct an evaluation using real estate agents/owners to see if solar features were a primary purchasing factor for buyers and whether to continue the program as standard in the unincorporated county.

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------------|
| 2020: | 70 MTCO ₂ e |
| 2035: | 530 MTCO ₂ e |
| Community Costs: | High |
| City Savings: | Low-Mid |
| Implementation Time Frame: | Mid-Term (No later than 2020) |
| Responsible Agencies: | Planning & Building, Housing, in partnership with Joint Venture Silicon Valley |
| Applicability: | New Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Supports Local Economy Provides Community Savings |
| 2020 Performance Targets: | Participation of 50 households with 5 kW systems |
| 2035 Performance Targets: | Participation of 442 households with 5 kW systems |

Assumptions:

Assume the pilot program begins in 2020 with 50 homes. Assume energy production from the PV panels and solar water heaters based on averages used to quantify the CSI program (see details for RE Measure 1 and RE Measure 2). Costs are assumed to be one-time costs associated with purchasing and installing the systems.

Sources:

N/A

4.5 Renewable Financing

Encourage the adoption of new, innovative financing options for renewable installations.

Action Items:

- Work with the local real estate community and other partners to encourage appropriate options, such as power purchase agreements (PPA), "solar leases," or a Property Assessed Clean Energy (PACE) program.
- Continue to promote financing options through existing County programs.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------|
| 2020: | 3,100 MTCO ₂ e |
| 2035: | 10,810 MTCO ₂ e |
| Community Costs: | High |
| City Savings: | High |
| Implementation Time Frame: | Near-Term (Between 2011 and 2015) |
| Responsible Agencies: | Tax Collector/Treasurer/Revenue Services, Planning & Building |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Supports Local Economy Provides Educational Opportunities Provides Community Savings |
| 2020 Performance Targets: | Participation of 3,450 households and 93 businesses in program |
| 2035 Performance Targets: | Participation of 13,107 households and 397 businesses in program |

Assumptions:

Assume 2/3 of all PACE installations are solar PV, and each installation has a capacity of 5 kw. Assume 1/3 of all installations are solar water heaters. Costs are annual and assume the total cost of the installation is \$34,000 for PV and \$3,000 for solar water heaters.

Sources:

Sonoma County's Energy Independence Program. 2012. Program Activity Dashboard. <http://www.sonomacountyenergy.org/>.

US Census. 2010.

4.6 Commercial Wind Power

Encourage the development of commercial wind farms.

Action Items:

- Research and identify the areas with the highest feasibility for commercial wind power, including locations near existing power facilities and existing transmission lines.
- Work with utility providers and renewable energy interest groups to attract interested commercial wind power businesses.

- Encourage commercial wind farms only in locations that minimize impacts to wildlife and are determined to be bird-safe.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building |
| Applicability: | Other |
| Mandatory or Voluntary: | Other |
| Community Benefits: | Provides Community Savings Reduces Energy Demand Supports Local Economy |
| 2020 Performance Targets: | Number of commercial wind farms |
| 2035 Performance Targets: | Number of commercial wind farms |

Assumptions:

N/A

Sources:

N/A

4.7 Incentivize Wind Energy

Incentivize safe and effective small distributed generation wind power systems on existing development in locations that complement existing land uses.

Action Items:

- Identify and develop methods to address barriers to wind energy development, including permitting issues and potential opposition from the local community.
- Create expedited permit processing for distributed generation wind power systems.
- Update development standards to allow distributed generation wind power systems by right in appropriate land use designations, where impacts on birds and wildlife can be mitigated.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------|
| 2020: | 430 MTCO ₂ e |
| 2035: | 680 MTCO ₂ e |
| Community Costs: | Medium-High |
| City Savings: | Medium |
| Implementation Time Frame: | Near Term (5-10 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | New and existing development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Air Quality Improves Public Health |
| 2020 Performance Targets: | Participation of 143 households and 62 businesses |
| 2035 Performance Targets: | Participation of 247 households and 108 businesses |

Assumptions:

Assumes 3kW generated for each residential system and 10kW generated per non-residential system. Costs are assumed to be one-time and upfront based on current average price. Current rebates are also included in the calculation.

Sources:

N/A

4.8 Investigate Community Choice Aggregation

Investigate Community Choice Aggregation (CCA) to allow residents and businesses in the unincorporated county to aggregate their buying power to purchase renewable energy.

Action Items:

- Conduct a feasibility study to determine costs, benefits, and other issues. Review results with relevant stakeholders. If appropriate for the County, move forward with a detailed implementation plan.

GHG Reductions:

| | |
|------------------|--------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| City Savings: | Low |

| | |
|----------------------------|------------------------------------------------|
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Public Works, Housing |
| Applicability: | Other |
| Mandatory or Voluntary: | Other |
| Community Benefits: | Improves Air Quality Improves Public Health |
| 2020 Performance Targets: | Studies or recommendations related to CCA |
| 2035 Performance Targets: | Studies or recommendations related to CCA |

Assumptions:

N/A

Sources:

N/A

4.9 Emissions Offset Programs

Allow new development projects to participate in energy offset programs to purchase electricity generated from renewable sources off site.

Action Items:

- Provide educational materials regarding offset purchasing options to developers and other project partners.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------|
| 2020: | 2,630 MTCO ₂ e |
| 2035: | 22,380 MTCO ₂ e |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Mid-Term (5-10 Years) |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | New development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Public Health Reduces Energy Demand |
| 2020 Performance Targets: | Participation of 13 households |

2035 Performance Targets: Participation of 109 households

Assumptions:

Assumes Renewable Energy Certificates (REC) cover half of new development energy use starting in 2019. Cost assumes REC price of \$5.00 per MWH.

Sources:

US Department of Energy. 2012. Renewable Energy Certificates. <http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>

4.10 Waste-to-Energy

Incentivize or encourage the use of green waste and food waste for alternative energy generation.

Action Items:

- Gather information on the current use of agricultural waste and food waste in the unincorporated county, and provide incentives and/or educational material regarding digesters and other technologies. External financial incentives may be available.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------------------|
| 2020: | 50 MTCO ₂ e |
| 2035: | 140 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Near-Term (Between 2011 and 2015) |
| Responsible Agencies: | Public Works |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings Provides Educational Opportunities |
| 2020 Performance Targets: | Divert 4,250 tons of food and green waste into WTE plant |
| 2035 Performance Targets: | Divert 11,980 tons of food and green waste into WTE plant |

Assumptions:

Assume 66 kWh are generated per ton of waste digested. One-time upfront cost for the digester, including up to \$180,000 of rebates is assumed to be approximately \$575,000.

Sources:

California Energy Commission. 2008. Anaerobic Phased Solids Digester Pilot Demonstration Project. <http://www.onsitepowersystems.com/files/UCDavisBiogasEnergyPlantConstuctionReport-08.pdf>.

5.1 General Plan and Zoning Updates

Update the General Plan and Zoning Ordinance to encourage transit-oriented, mixed-use developments at appropriate locations.

Action Items:

- Where feasible, new projects should have a mix of the following on site or off site within a quarter of a mile: residential, office, retail, park, or open space.
- Where feasible for new development, the project should be designed to encourage walking, bicycling, and utilization of public transportation to and from jobs, shopping, recreation, and other uses.
- Where feasible, new projects should be centrally located near existing transit corridors where public transportation is easily accessible.

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------|
| 2020: | 420 MTCO ₂ e |
| 2035: | 380 MTCO ₂ e |
| Community Costs: | Low |
| City Savings: | Medium-Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Mobility |
| 2020 Performance Targets: | Density of 9 housing units per acre and 45 intersections per square mile |
| 2035 Performance Targets: | Density of 9 housing units per acre and 45 intersections per square mile |

Assumptions:

Assess the impact of increased density on decreased auto use, assuming the lower range of impact CAPCOA identifies for rural or suburban communities (see CAPCOA Measure LUT-1).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

5.2 Impact Fees

Create an impact fee program for new projects to encourage development in locations with high accessibility to destinations such as jobs, retail, and other attractions. The impact fee program will also be used to fund public transit improvements or school bus programs (as discussed in Measure 6.3 and 6.4).

Action Items:

- Work with partners to create an effective impact fee program.
- Identify the most feasible and cost effective opportunities to fund with the impact fee program, including bus amenity improvements and transit maintenance.

GHG Reductions:

| | |
|----------------------------|------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Medium |
| Community Savings: | Low-Medium |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Mobility Improves Public Health Promotes Equity |
| 2020 Performance Targets: | Adoption of a traffic impact fee program and revenue generated through the program |
| 2035 Performance Targets: | Adoption of a traffic impact fee program and revenue generated through the program |

Assumptions:

N/A

Sources:

N/A

5.3 Pedestrian Design

As appropriate, require new projects in North Fair Oaks, urban communities, and business district to include improved design elements to enhance walkability and connectivity while balancing impacts on vehicle congestion.

Action Items:

- Pedestrian-friendly design may be evaluated in terms of building setbacks, reduced street widths, small block size, proportions of four-way intersections, sidewalk coverage with adequate sidewalk width, number of pedestrian crossings, presence of street trees, and other physical variables that enhance pedestrian-oriented environments.
- New projects will provide pedestrian access to uses within the project site and will also link to destinations near the project site. Barriers to pedestrian access and interconnectivity will be mitigated.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------------------------------|
| 2020: | 250 MTCO ₂ e |
| 2035: | 230 MTCO ₂ e |
| Community Costs: | Medium |
| Community Savings: | Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Public Health Improves Mobility |
| 2020 Performance Targets: | Increase in density from an estimated 5 units per acre to 9 units per acre |
| 2035 Performance Targets: | Increase in density from an estimated 5 units per acre to 9 units per acre |

Assumptions:

Look at the impact of enhanced pedestrian facilities when combined with higher-density land uses (see CAPCOA Measure LUT-1).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

6.1 Neighborhood Retail

When updating the General Plan, look for opportunities to add neighborhood-serving retail at key locations throughout the unincorporated county.

Action Items:

- Through the General Plan update, identify strategies to encourage co-location of neighborhood-serving uses.
- Through existing economic development strategies, actively recruit and engage potential businesses and vendors that could provide essential services to isolated communities.

GHG Reductions:

| | |
|----------------------------|------------------------------------------------------|
| 2020: | 990 MTCO ₂ e |
| 2035: | 900 MTCO ₂ e |
| Community Costs: | Medium-High |
| City Savings: | Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | New Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Mobility Supports Local Economy |
| 2020 Performance Targets: | All development: 90% residential with 10% commercial |
| 2035 Performance Targets: | All development: 90% residential with 10% commercial |

Assumptions:

Assume the increase in diversity changes from 100% residential to 90% residential with 10% commercial, leading to greater co-location of uses and reduced vehicular travel (see CAPCOA Measure LUT-3).

Sources:

California Air Pollution Control officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

6.2 Traffic Calming in New Construction

Require larger new projects (including existing projects with major renovations) to implement traffic calming measures at the site, as determined through the plan review process.

Action Items:

- Larger new projects will complete a study to identify appropriate traffic calming features, including, but not limited to, marked crosswalks, countdown signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, roundabouts or mini-circles, on-street parking, planter strips with street trees, and chicanes/chokers.

- Require larger new projects to provide short-term and long-term bicycle parking facilities.
- As appropriate, use the County right-of-way to provide pedestrian infrastructure.
- Support implementation of the C/CAG Bicycle and Pedestrian Master Plan, including implementation of Class I and Class II bicycle lanes.
- In coordination with C/CAG, adopt a local Complete Streets Ordinance for the unincorporated county consistent with the One Bay Area Grant Program requirements.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2020: | 180 MTCO ₂ e |
| 2035: | 150 MTCO ₂ e |
| Community Costs: | Medium |
| City Savings: | Medium |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works, in partnership with C/CAG |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Mobility Improves Public Health |
| 2020 Performance Targets: | 7–10% of county roads and intersections have new traffic calming devices implemented at roadway segments or intersections |
| 2035 Performance Targets: | 7–10% of county roads and intersections have new traffic calming devices implemented (of these improvements, 50% are to roads, 50% are to intersections) |

Assumptions:

Using CAPCOA guidance, the successful completion of these targets assumes a 0.05% reduction in VMT (see CAPCOA Measure SDT-2).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

6.3 Traffic Impact Fund

Use the impact fee program discussed in Measure 5.2 to fund transit improvements, optimization, and expansion in the unincorporated county.

Action Items:

- Require the adoption of the transit expansion program in the new impact fee program update.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Medium |
| Community Savings: | Low-Medium |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | Other |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Mobility Promotes Equity Improves Air Quality Improves Public Health |
| 2020 Performance Targets: | Number of transit improvements funded through the transit impact fee program |
| 2035 Performance Targets: | Number of transit improvements funded through the transit impact fee program |

Assumptions:

N/A

Sources:

N/A

6.4 Expand Transit

Work with SamTrans to optimize the local transit network by adding or modifying existing transit service to enhance the service near future project sites and areas of future demand in the unincorporated county.

Action Items:

- Encourage SamTrans to reduce transit-passenger travel time through more reduced headways and increased speed and reliability.

- Support improved access to transit facilities through sidewalk/crosswalk safety and bus shelter enhancements. These improvements make transit service more attractive and may result in a mode shift from auto to transit that reduces vehicle miles traveled (VMT).

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 2020: | 350 MTCO ₂ e |
| 2035: | 300 MTCO ₂ e |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building partnering with SamTrans |
| Applicability: | Other |
| Mandatory or Voluntary: | Other |
| Community Benefits: | Improves Mobility Promotes Equity Improves Air Quality Improves Public Health |
| 2020 Performance Targets: | Transit mode share of 4–5%, expansion of miles covered by the transit network by 2.5%, 13% increase in transit frequency (headways). |
| 2035 Performance Targets: | Transit mode share of 4–5%, expansion of miles covered by the transit network by 2.5%, 13% increase in transit frequency (headways). |

Assumptions:

Assume a .05% VMT reduction as a result of increased transit system coverage and an additional .05% reduction as a result of increased route frequency. Quantifies the impact of both improved headways and increased mileage covered with transit service (see CAPCOA Measure TST-3 and TST-4).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

7.1 Parking Ordinance

Amend the Zoning Ordinance to allow a reduction in parking requirements if deemed appropriate, and establish parking maximums, standards that will limit the number of parking spots in new projects and allow for flexible parking reductions to discourage an over-reliance on auto travel

Action Items:

- Adopt standards that allow for multiple uses with staggered parking demand.

- Support provision of parking based on actual demand versus land use when lower than as required in code, if supported by findings from a parking study.
- Further allow for reductions in parking demand when employers provide a Transportation Demand Management (TDM) program, uses are located within close proximity to bus stop/transit, or for mixed-use projects.
- Work with appropriate entities including the North Fair Oaks Community Council to evaluate and identify appropriate pilot strategies for effective parking requirements that encourage alternative modes of travel.

GHG Reductions:

| | |
|----------------------------|--------------------------------------|
| 2020: | 1,170 MTCO ₂ e |
| 2035: | 1,050 MTCO ₂ e |
| Community Costs: | Medium-High |
| Community Savings: | Medium |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building |
| Applicability: | New Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Mobility Promotes Equity |
| 2020 Performance Targets: | 10% reduction in parking supply |
| 2035 Performance Targets: | 10% reduction in parking supply |

Assumptions:

Quantify the reduction in VMT that is anticipated due to restrictions in parking supply, assuming an average daily VMT reduction of 0.35% (see CAPCOA Measure PDT-1).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

7.2 Efficient Parking Design

Evaluate the existing parking standards and look for ways to increase efficiency.

Action Items:

- Examine standards in the Colma (PC) district and standards in other similar jurisdictions for use as replicable models.

- Support options to maintain pedestrian infrastructure while meeting adequate parking demands through efficient underground parking, structures, or other alternatives, as feasible.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Public Works, Planning & Building |
| Applicability: | Other |
| Mandatory or Voluntary: | Other |
| Community Benefits: | Promotes Equity Improves Air Quality Improves Mobility Improves Public Health |
| 2020 Performance Targets: | Preparation of recommendations to increase the efficiency of parking standards. |
| 2035 Performance Targets: | Preparation of recommendations to increase the efficiency of parking standards. |

Assumptions:

N/A

Sources:

N/A

7.3 Unbundled Parking

Work with stakeholders to unbundle parking costs from property costs at strategic locations in the county, including North Fair Oaks, the Middlefield Road area, the small business district in West Menlo Park, and areas in Emerald Lakes Hills. Unbundling separates parking from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost from the property cost. This removes the burden from those who do not wish to utilize a parking space.

Action Items:

- Parking will be priced separately from home rents/purchase prices or office leases. An assumption is made that the parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces.

- Partner with the North Fair Oaks Community Council to identify, test, and implement appropriate pilot parking projects at select sites, including strategies such as parking pricing and metered parking.

GHG Reductions:

| | |
|----------------------------|-----------------------------------------------------|
| 2020: | 2,320 MTCO ₂ e |
| 2035: | 2,100 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Medium |
| Implementation Time Frame: | Near-Term (5–10 Years) |
| Responsible Agencies: | Public Works |
| Applicability: | Other |
| Mandatory or Voluntary: | Other |
| Community Benefits: | Promotes Equity Improves Public Health |
| 2020 Performance Targets: | \$2.50 per day parking charge in business districts |
| 2035 Performance Targets: | \$2.50 per day parking charge in business districts |

Assumptions:

Assume that a \$2.50 per day parking charge in business districts will result in an average daily VMT reduction of .7% based on CAPCOAS range of .5% to .9% (see CAPCOA Measure PDT-1).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

8.1 Employee Commute

Require all large employers to implement a Commute Trip Reduction (CTR) program to discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as walking, biking, transit riding, carpooling, vanpooling, and ridesharing.

Action Items:

- Adopt annual reporting and monitoring requirements. Employers will be required to demonstrate implementation of the CTR program and report the resulting commute mode shares.
- Coordinate efforts with the Peninsula Traffic Congestion Relief Alliance (commute.org).

GHG Reductions:

| | |
|-------|---------------------------|
| 2020: | 1,240 MTCO ₂ e |
|-------|---------------------------|

| | |
|----------------------------|-----------------------------------------------------------------------------------------------------------------|
| 2035: | 1,130 MTCO ₂ e |
| Community Costs: | High |
| City Savings: | Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, in partnership with C/CAG, Traffic Congestion Relief Alliance |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Supports Local Economy Provides Community Savings |
| 2020 Performance Targets: | 10% to 25% of employers to charge \$3 per day for parking, 25% to 50% of employers subsidizing employee transit |
| 2035 Performance Targets: | 10% to 25% of employers to charge \$3 per day for parking, 25% to 50% of employers subsidizing employee transit |

Assumptions:

Assume that 25–50% of employers subsidizing transit costs for their employees will lead to a VMT reduction of 0.3% by increasing employee mode split. Assumes that 10–25% of employers charging \$3 per day for parking will lead to a VMT reduction of 0.08% (see CAPCOA Measures TRT-4 and TRT-14).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

8.2 Workplace Parking

Implement workplace parking pricing at employment centers.

Action Items:

- This measure may include requiring businesses to charge employees for parking, implementing above-market-rate pricing, validating parking only for invited guests, not providing employee parking and transportation allowances, and educating employees about available alternatives.
- Work with employers to refine parking strategies to achieve efficient and optimal commute levels.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | High |
| City Savings: | Medium |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Planning & Building, in partnership with C/CAG |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Supports Local Economy Improves Air Quality |
| 2020 Performance Targets: | Adoption of workplace parking policies and requirements |
| 2035 Performance Targets: | Adoption of workplace parking policies and requirements |

Assumptions:

N/A

Sources:

N/A

8.3 Employer Transit Subsidies

Require employers to provide a subsidized/discounted daily or monthly public transit pass to employees.

Action Items:

- Seek to identify partnership opportunities to fund transit subsidies that minimize impacts to businesses.

- Work in partnership with SamTrans, school districts, or private developments to identify funding. Many entities use revenue from parking to offset the cost of such a project.

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | High |
| City Savings: | Medium |
| Implementation Time Frame: | Near-Term (0-5 Years) |
| City Savings: | City Costs |
| Implementation Time Frame: | Near-Term (0–5 years) |
| Responsible Agencies: | Planning & Building, in partnership with C/CAG |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Supports Local Economy Provides Community Savings |
| 2020 Performance Targets: | Number of employers providing subsidized/discounted daily or monthly public transit passes |
| 2035 Performance Targets: | Number of employers providing subsidized/discounted daily or monthly public transit passes |

Assumptions:

N/A

Sources:

N/A

8.4 Work Shuttles

Promote expansions of worker shuttle programs.

Action items:

- Participate in the Shuttle Business Practices Task Force.
- Engage employers to identify appropriate strategies for shuttle participation and funding.
- Facilitate the coordination of smaller employers with the Peninsula Traffic Congestion Relief Alliance to pull together resources to establish a feasible program.

GHG Reductions:

| | |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2020: | 160 MTCO ₂ e |
| 2035: | 140 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Public Works, C/CAG, Traffic Congestion Relief Alliance, San Mateo County Transportation Authority |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Mobility Provides Community Savings |
| 2020 Performance Targets: | Participation of 50% of employees in 5–20% of employers participate in a shuttle program Participation of 50% of employees in 5–20% of employers participate in a shuttle program |

Assumptions:

Assuming that 50% of employees would be able to utilize commute programs, and assuming that 5% to 20% of those employees would actually use transit as a result of program efforts, this measure assumes a 0.05% reduction in VMT (see CAPCOA Measure TRT-1).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

9.1 Alternative School Transit

Promote school shuttle programs to reduce vehicle miles traveled (VMT).

Action Items:

- Work with local schools to restore/expand local school bus service, create a school pool ridesharing program, or start a walking school bus.
- Implement other supportive programs for school travel, such as Safe Routes to School programs for schoolchildren.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2020: | 20 MTCO ₂ e |
| 2035: | 20 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Health, Public Works, in partnership with San Mateo County Office of Education, Traffic Congestion Relief Alliance, San Mateo County Transportation Authority |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Mobility Promotes Equity |
| 2020 Performance Targets: | School bus route restoration/increase by 25–75% of schools with 25–50% of students riding. 25–75% of students participating in a school pool ridesharing program. |
| 2035 Performance Targets: | School bus route restoration/increase by 25–75% of schools with 25–50% of students riding. 25–75% of students participating in a school pool ridesharing program. |

Assumptions:

Assume that 25–50% of students utilizing school buses in 25–75% of schools with restored/increased bus programs will result in a reduction of VMT by 1.94%. Also assume that 25–75% of students participating in school pools will lead to a .37% reduction in VMT (see CAPCOA Measure TRT-10 and TRT-13).

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

10.1 Low Carbon Fuel Infrastructure

Increase alternative fuel infrastructure in the community.

Action Items:

- Incentivize the installation of electric vehicle (EV) charging stations in public areas and in more urban neighborhoods; and where there are five parking spaces or more in a project, require at least one charging station be installed as well as the installation of an electrical conduit within hardscape to allow additional spots to be easily added later.
- Establish neighborhood electric vehicle (NEV) networks by identifying streets and locations appropriate for NEV use in the Transportation Element of the County's General Plan.
- Seek grant funding through the state and regional partnerships to fund fleet conversions to alternative and low-emissions fuels.

GHG Reductions:

2020: 1,780 MTCO₂e

2035: 2,200 MTCO₂e

Community Costs: Medium-High

Community Savings: Low

Implementation Time Frame: Near-Term (0–5 Years)

Responsible Agencies: Planning & Building, Public Works

Applicability: New & Existing Development

Mandatory or Voluntary: Voluntary

Community Benefits: Improves Mobility
Provides Community Savings
Improves Air Quality

2020 Performance Targets: The use of 100 NEVs, installation of 200 EV charging stations and 20% of households participating in a rideshare program

2035 Performance Targets: The use of 300 NEVs, installation of 500 EV charging stations and 40% of households participating in a rideshare program

Assumptions:

Households with NEVs are estimated to reduce VMT from traditional vehicles by approximately 12%. Each charging station is estimated to cause a reduction of 8,000 VMT per year. Car sharing participants are estimated to travel 1,500 annual VMT less than the average driver.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying and Mitigating Greenhouse Gas Emissions.

10.2 Alternative Fuel Outreach

Educate the public on the feasibility, availability, and incentives for alternatively fueled vehicles.

Action Items:

- Work with the BAAQMD, the Sierra Club, and other community partners to promote electric vehicle incentives and opportunities.
- Provide resources for electric vehicles on the County’s website and Green Portal.

GHG Reduction Strategies:

| | |
|----------------------------|--------------------------------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Public Library |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Air Quality Provides Educational Opportunities |
| 2020 Performance Targets: | Number of information contacts or materials produced related to incentives for alternatively fueled vehicles |
| 2035 Performance Targets: | Number of information contacts or materials produced related to incentives for alternatively fueled vehicles |

Assumptions:

N/A

Sources:

N/A

11.1 Energy-Efficient Agriculture

Conduct a public outreach campaign to educate farmers and growers of easy and low- to no-cost energy efficiency practices.

Action Items:

- Work with farming associations to provide lists of more efficient agricultural equipment and support wholesale equipment acquisition.
- Partner with the County Department of Agricultural and other groups to promote energy-efficient practices.
- Pursue funding opportunities to facilitate the conversion of agricultural equipment to follow Carl Moyer standards.

GHG Reduction Strategies:

| | |
|----------------------------|------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Agriculture/Weights & Measures |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Community Savings |
| 2020 Performance Targets: | Pieces of agricultural equipment replaced with energy-efficient models |
| 2035 Performance Targets: | Pieces of agricultural equipment replaced with energy-efficient models |

Assumptions:

N/A

Sources:

N/A

11.2 Agricultural Best Practices

Create resources to promote best practices for agricultural management to establish a list of best practices for agricultural management.

Action Items:

- Collaborate with stakeholders such as the Farm Bureau, UC Cooperative Extensions, the USDA, Resource Conservation District, Natural Resources Conservation Service (NRCS), and other regional agricultural authorities and groups.
- Create a voluntary reporting program to track improvements in fertilizer use and promote agricultural leaders.
- Promote best practices such as soil tillage and fertilizer management.
- Develop a self-assessment program and facilitate voluntary audits for agricultural practices in partnership with farming stakeholders and organizations.
- Encourage low global warming potential (GWP) pesticides and fumigants.
- Work with farming associations to provide lists of more efficient agricultural equipment and support wholesale equipment acquisition.

GHG Reduction Strategies:

| | |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Agriculture/Weights & Measures |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Energy Demand Provides Educational Opportunities Provides Community Savings |
| 2020 Performance Targets: | Number of farming enterprises voluntarily reporting GHGs, number of information contacts or resources developed to encourage agricultural best practices |
| 2035 Performance Targets: | Number of farming enterprises voluntarily reporting GHGs, number of information contacts or resources developed to encourage agricultural best practices |

Assumptions:

N/A

Sources:

N/A

12.1 Sustainable Agriculture

Streamline regulations for the farming community to support sustainable practices and GHG reductions.

Action Items:

- Simplify the permitting process for water permits and off-stream ponds for agricultural uses that can be used for summer irrigation and reduce use of stream and potable water.
- Consider allowing appropriate sustainable farming practices in non-farmed areas that will contribute to the County's land use goals, as appropriate based on activities to control erosion and other land impacts.
- Work with the Mid-Peninsula Regional Open Space District and stakeholders to identify appropriate agricultural uses.
- Encourage urban agriculture through zoning and land use designations, and support an expansion of certified farmers markets.

GHG Reductions:

| | |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Agriculture/Weights & Measures |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Provides Educational Opportunities Protects Natural Resources Provides Community Savings Reduces Energy Demand |
| 2020 Performance Targets: | Number of new certified farmers markets, adoption of overlays districts that allow an expansion of appropriate farming practices |
| 2035 Performance Targets: | Number of new certified farmers markets, adoption of overlays districts that allow an expansion of appropriate farming practices |

Assumptions:

N/A

Sources:

N/A

13.1 Use of Recycled Materials

Require new development to incorporate a minimum of 15% of recycled materials into construction to encourage the market development for recycled goods.

Action Items:

- Update construction and demolition requirements to include standards for recycled content.
- Provide through various County channels (including Planning and Building desks, RecycleWorks, and website, and provide directly to local design and construction professionals for their clients) printed and electronic information on available tax deductions and how much people can save by arranging for reusable materials to be take from site pre-demolition (e.g., The ReUse People).
- Promote local enterprises that provide recycled goods.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Medium-High |
| Community Savings: | Low |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Public Works |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Public Health Improves Air Quality |
| 2020 Performance Targets: | Achieve an 8–10% decrease in waste associated with construction materials |
| 2035 Performance Targets: | Achieve an 8–10% decrease in waste associated with construction materials |

Assumptions:

Calculate the benefit from diverted construction and demolition waste and avoided landfill emissions, assuming the impact in forecasted new development. Rely on the waste emissions coefficients calculated in the baseline inventory, using the ARC Landfill Emissions Tool.

Sources:

California Air Resources Board (CARB). 2011. ARC Landfill Emissions Tool. <http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm>.

13.2 Zero Waste

Work toward zero waste through comprehensive recycling and composting programs, in addition to aggressive outreach efforts.

Action Items:

- Adopt recycling ordinances that incorporate new standards for trash, recycling, and composting collection enclosures. For example, require enclosures to accommodate two 4-yard containers.
- Nominate county businesses with high diversion rates for recognition through CalRecycle's Waste Reduction Awards Program (WRAP).
- Work with trash providers to increase the types of recyclables and organic materials that trash collection services will accept for recycling.
- Continue outreach efforts through RecycleWorks Programs.
- Work with apartment building owners and managers to implement recycling programs.
- Work with waste providers to provide food waste services for commercial restaurants and curbside composting or centralized composting drop-offs for residential customers.
- Encourage the provision of green waste options for all residents and all applicable commercial properties.
- Collaborate with landfill operators and owners to investigate feasibility of expanding services to include local composting facilities and resources.

GHG Reductions:

| | |
|----------------------------|-------------------------------------------|
| 2020: | 14,900 MTCO ₂ e |
| 2035: | 21,960 MTCO ₂ e |
| Community Costs: | Medium-High |
| Community Savings: | Low |
| Implementation Time Frame: | Short-Term |
| Responsible Agencies: | Public Works |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory for New, Voluntary for Existing |

| | |
|---------------------------|--------------------------------------------------------------------------------------------|
| Community Benefits: | Improves Public Health Improves Air Quality |
| 2020 Performance Targets: | Achieve a 4 pounds/person/day waste disposal rate, including a 25% diversion of food waste |
| 2035 Performance Targets: | Achieve a 4 pounds/person/day waste disposal rate, including a 25% diversion of food waste |

Assumptions:

Rely on ARB’s Landfill Emissions Tool to estimate the emissions impact of reduced landfill waste. Assumes CalRecycle trends for the baseline year to identify the contribution of alternative daily cover and green waste.

Sources:

California Air Resources Board (CARB). 2011. ARC Landfill Emissions Tool. <http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm>.

CalRecycle (2011). Disposal Reporting System (DRS). <http://www.calrecycle.ca.gov/LGcentral/Reports/DRS/default.aspx>.

13.3 Waste-to-Energy Facility

Investigate the creation of an agricultural and food waste-to-energy (WTE) biomass facility in San Mateo County.

Action Items:

- Work with regional and local partners to identify opportunities for partnership and expansion of WTE enterprises.
- Partner with other landfill operators in the unincorporated county to actively recruit WTE companies.
- Using existing economic development efforts, identify potential incentives to market to WTE companies.

GHG Reductions:

| | |
|----------------------------|-----------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| City Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |

| | |
|---------------------------|---------------------------------------------------------------------------------------------------|
| Community Benefits: | Improves Public Health Improves Air Quality |
| 2020 Performance Targets: | Number of agricultural and food waste-to-energy facilities developed in the unincorporated county |
| 2035 Performance Targets: | Number of agricultural and food waste-to-energy facilities developed in the unincorporated county |

Assumptions:

N/A

Sources:

N/A

13.4 Landfill Gas Capture

Continue to monitor and promote emerging technologies to increase landfill gas capture and combustion efficiency and to reduce fugitive emissions in each process.

Action Items:

- Showcase the Ox Mountain Landfill as a leader in landfill gas management.
- Investigate feasibility of installing landfill gas capture and combustion systems (gas-to-energy) at closed landfills within the unincorporated county.

GHG Reductions:

| | |
|----------------------------|-----------------------------------------------------------------------------------------------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Public Health Improves Air Quality |
| 2020 Performance Targets: | Number of landfill gas capture and combustion systems installed at landfills in the unincorporated county |
| 2035 Performance Targets: | Number of landfill gas capture and combustion systems installed at landfills in the unincorporated county |

Assumptions:

N/A

Sources:

N/A

14.1 Smart Water Meters

Work with water companies that serve the community to install smart water meters on 50% of residential and commercial customers by 2015 and 95% by 2020.

Action Items:

- Support and promote efforts to install smart water meters.
- Promote successful projects using smart water meters to reduce water use.

GHG Reductions:

| | |
|----------------------------|------------------------------------------------------------------------------------------------------------------------|
| 2020: | 140 MTCO ₂ e |
| 2035: | 140 MTCO ₂ e |
| Community Costs: | Medium |
| Community Savings: | Low |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Reduces Water Consumption Reduces Energy Demand Provides Educational Opportunities Provides Community Savings |
| 2020 Performance Targets: | 50% installation of smart water meters by 2015; 95% by 2020 |
| 2035 Performance Targets: | Installation of smart water meters on 95% of customers by 2020 |

Assumptions:

Assume that a 10% reduction in water use will occur with the use of smart water meters. Oracle studies demonstrate that smart meters reduce water use by 5–15%.

Sources:

Oracle Utilities. 2009. Smart Metering for Water Utilities. <http://www.oracle.com/us/industries/utilities/046596.pdf>.

14.2 Water Reuse

Increase the use of grey, rain, and recycled water for landscaping and agricultural purposes throughout the community to reduce the use of potable water.

Action Items:

- Partner with urban providers to provide recycled water to the more built-up communities in San Mateo County, focusing on North Fair Oaks.
- Require new development in the County's area plans to provide dual plumbing in anticipation of available recycled water, and update countywide standards related to water reuse.
- Work with wastewater providers to investigate the feasibility of a recycled water system throughout the county.
- Pass an ordinance allowing do-it-yourself methods for greywater systems that meet public health and safety standards. Target areas with leach fields and septic tanks for outreach and education on greywater systems, which are areas that would not otherwise be impacted by regulations and incentives for sewer systems.
- Provide education on options for affordable greywater systems that provide adequate treatment.
- Provide permit incentives for greywater systems that follow the County's Environmental Health best management practices.

GHG Reductions:

| | |
|----------------------------|---------------------------------------------------------|
| 2020: | 30 MTCO ₂ e |
| 2035: | 60 MTCO ₂ e |
| City Costs: | Medium |
| City Savings: | Low-Medium |
| Implementation Time Frame: | Mid-Term (5–10 Years) |
| Responsible Agencies: | Planning & Building, Public Works, Environmental Health |
| Applicability: | New & Existing Development |
| Mandatory or Voluntary: | Mandatory for New, Voluntary for Existing |
| Community Benefits: | Reduces Water Consumption Reduces Energy Demand |

| | |
|---------------------------|-------------------------------------|
| | Provides Educational Opportunities |
| | Provides Community Savings |
| 2020 Performance Targets: | Household participation rate of 25% |
| 2035 Performance Targets: | Household participation rate of 50% |

Assumptions:

Assume that participating households will capture all of their potential greywater and reuse in-lieu of potable water. Calculation uses the baseline inventory average energy-intensity for water transport, supply, and treatment to identify avoided electricity emissions associated with water conservation.

Sources:

Sheikh, Bahman. 2010. White Paper on Graywater. Water Reuse Association.

15.1 Construction Idling

Adopt ordinances and policies that aim to reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles to exceed the Bay Area Air Quality Management District's (BAAQMD) requirements.

Action Items:

- Minimize idling times either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes
- Require maintenance of construction equipment per manufacturer specifications.
- Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting measures identified by the Bay Area Air Quality Management District.

GHG Reductions:

| | |
|----------------------------|------------------------------------------------|
| 2020: | 7,290 MTCO ₂ e |
| 2035: | 14,040 MTCO ₂ e |
| Community Costs: | Medium-High |
| Community Savings: | Medium |
| Implementation Time Frame: | Near-Term (0–5 Years) |
| Responsible Agencies: | Planning & Building, Public Works |
| Applicability: | New Development |
| Mandatory or Voluntary: | Mandatory |
| Community Benefits: | Improves Public Health Improves Air Quality |

Provides Community Savings

| | |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 2020 Performance Targets: | 40% of construction equipment is efficient or alternatively fueled; construction equipment complies with idling restrictions 50% of the time |
| 2035 Performance Targets: | 65% of construction equipment is efficient or alternatively fueled; construction equipment complies with idling restrictions 50% of the time |

Assumptions:

Reducing maximum idling times from the state requirement of 5 minutes to 3 minutes will result in approximately 40% less fuel used for idling equipment. It is estimated that idling accounts for 5% of all fuel used in construction equipment. Additionally, voluntary conversion of construction equipment from diesel to CNG, electric, or biodiesel will result in fewer GHG emissions. Assume equipment emissions identified in the baseline inventory, based on CARB's OFFROAD model.

Sources:

California Air Resources Board (CARB). 2007. OFFROAD 2007. Version 2.0.1.3. <http://www.arb.ca.gov/msei/offroad/offroad.htm>

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

15.2 Electrification in New Homes

Facilitate the conversion of outdoor household equipment to more efficient models.

Action Items:

- Encourage and support programs that replace conventional lawn mowers and gardening equipment with electric versions through materials, the County's website, and at public events.
- Support the Bay Area Air Quality Management District's (BAAQMD) efforts to re-establish a voluntary exchange program for residential lawn mowers and backpack-style leaf blowers.
- Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.

GHG Reduction Strategies:

| | |
|----------------------------|-------------------------------------------------------------------------------------|
| 2020: | 140 MTCO ₂ e |
| 2035: | 140 MTCO ₂ e |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |
| Responsible Agencies: | Planning & Building, Housing in partnership with other departments to be determined |
| Applicability: | New & Existing Development |

| | |
|---------------------------|----------------------------------------------------|
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Improves Public Health Improves Air Quality |
| 2020 Performance Targets: | 650 leaf blowers and 2,200 lawn mowers exchanged |
| 2035 Performance Targets: | 2,200 leaf blowers and 4,970 lawn mowers exchanged |

Assumptions:

Switching leaf blowers and lawn mowers to electric from gasoline or diesel will result in decreased fuel consumption and GHG emissions, but will also result in a small increase in electricity use to power this equipment.

Sources:

California Air Resources Board (CARB). 2007. OFFROAD 2007. Version 2.0.1.3. <http://www.arb.ca.gov/msei/offroad/offroad.htm>.

16.1 Promote Sequestration Efforts

Identify opportunities for forestry sequestration on County lands, including but not limited to publicly owned forests.

Action Items:

- Create a Blue Ribbon Forestry Advisory Committee to facilitate pilot forestry sequestration projects and identify work programs and research, including representatives from groups such as the Sierra Club, Sustainable San Mateo County, San Mateo County Parks Foundation, the Pescadero Conservation Alliance, the Peninsula Open Space Trust, the Committee for Green Foothills, and government representatives from the County Sheriff, County Public Works, County/Cal Fire, the California Department of Fish and Game, the local forestry industry, and the local community of Loma Mar and La Honda.
- Support preparation of a countywide sequestration assessment of open space and forestlands.
- Investigate opportunities to generate revenue for sequestration through conservation-based mitigation banking and carbon offset programs.

GHG Reductions:

| | |
|----------------------------|--------------------|
| 2020: | Supportive Measure |
| 2035: | Supportive Measure |
| Community Costs: | Low |
| Community Savings: | Low |
| Implementation Time Frame: | Ongoing |

| | |
|---------------------------|------------------------------------------------------|
| Responsible Agencies: | Parks Department |
| Applicability: | Other |
| Mandatory or Voluntary: | Voluntary |
| Community Benefits: | Protects Natural Resources Improves Public Health |
| 2020 Performance Targets: | Creation of a Blue Ribbon Forestry Committee |
| 2035 Performance Targets: | Creation of a Blue Ribbon Forestry Committee |

Assumptions:

N/A

Sources:

N/A

APPENDIX D: BAAQMD COMPLIANCE

APPENDIX D



The County of San Mateo developed this Energy Efficiency and Climate Action Plan (EECAP) to meet the requirements of the Bay Area Air Quality Management District's (BAAQMD) criteria for a Qualified Greenhouse Gas Reduction Strategy as defined in the BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines. The CEQA Air Quality Guidelines were updated in 2010 in response to the state of California's amendment to the State CEQA Guidelines through Senate Bill (SB) 97. SB 97 requires all projects subject to CEQA to analyze and mitigate the greenhouse gas emissions that will occur.

The purpose of the BAAQMD CEQA Air Quality Guidelines is to assist lead agencies in evaluating the air quality impacts of proposed projects and plans within the San Francisco Bay Area Air Basin. The guidelines were updated to establish thresholds of significance for impacts related to greenhouse gas (GHG) emissions to be consistent with the requirements of CEQA. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project's impact on GHG emissions is less than significant if it is in compliance with a Qualified Greenhouse Gas Reduction Strategy.

The County's EECAP follows both the State CEQA Guidelines (Section 15183.5(b)) and BAAQMD's guidelines by incorporating the standard elements of a Qualified GHG Reduction Strategy into the EECAP. The standard elements of a Qualified GHG Reduction

Strategy include the following steps:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.
- 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.
- Monitor the plan's progress.
- Adopt the greenhouse gas reduction strategy in a public process following environmental review.

This appendix describes in detail how the County's EECAP has been developed to satisfy the requirements of the BAAQMD's guidelines on the standard elements of a Qualified GHG Reduction Strategy.

GHG EMISSIONS INVENTORY

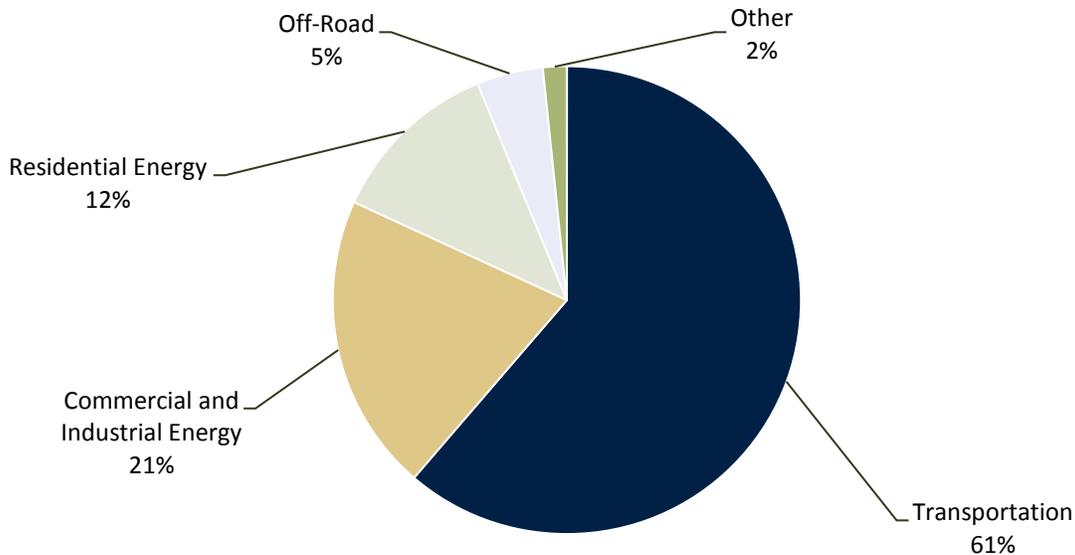
The first component of a Qualified GHG Reduction Strategy is to inventory GHG emissions within a specified geographic boundary. The County of San Mateo's GHG inventory utilizes a baseline year of 2005 to inventory carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) generated from activities by the San Mateo County community members in unincorporated areas of the county.

The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use related to water and wastewater, agricultural off-road equipment and emissions associated with fertilizer application, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in San Mateo County. In 2005, the County of San Mateo emitted approximately 782,080 metric tons of carbon dioxide equivalents (MTCO₂e) (see **Table D-1** and **Figure D-1**).

Table D-1. 2005 Community-Wide Baseline Emissions by Sector

| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|------------------------------------|---------------------|
| Transportation | 479,400 | 61% |
| Commercial and Industrial Energy | 160,900 | 21% |
| Residential Energy | 93,100 | 12% |
| Off-Road | 35,800 | 5% |
| Solid Waste | 8,380 | 1% |
| Agriculture | 3,000 | <1% |
| Water and Wastewater | 1,500 | <1% |
| TOTAL | 782,080 | |

Due to rounding, the total may not equal the sum of component parts.

Figure D-1. 2005 Community-Wide Baseline Emissions by Sector

Due to rounding, the total may not equal the sum of component parts.

Reflecting the unique characteristics of the unincorporated county, the inventory excludes several emissions sources as described below:

- Direct emissions (CH₄ and N₂O) from wastewater processing and water treatment.** Due to the diversity of service providers and disposal methods, at this time there is no accurate data available for the County to estimate direct emissions from wastewater. The unincorporated county is served by both septic tanks and numerous wastewater treatment providers, including county-operated sanitation districts, community service districts, sewer maintenance districts, and joint powers agencies. Wastewater processing is provided by 11 treatment plants, two of which are located outside of the county. Providers consist of the South Bayside System Authority, the City of Palo Alto, the City of San Mateo/Estero Municipal Improvement District, the City of Burlingame, the City of Millbrae, the San Francisco Airport Sewage Treatment facility, the cities of South San Francisco and San Bruno, the City of San Francisco Southeast Plant, the Mid-Coast Sewer Authority, and the North San Mateo County Sanitation District (San Mateo County 2011). Disaggregated data regarding each facility's service population within the unincorporated county is not available, complicating the ability to accurately estimate wastewater processing and treatment emissions for uses within the unincorporated county. In addition, due to the diversity of characteristics of these wastewater treatment facilities, identifying average emissions characteristics to apply to the entire unincorporated county would likely yield an inaccurate emissions estimate that would not be informative to policy development.
- In the Public Comment Draft of the US Community Protocol for Accounting and Reporting of GHG Emissions (ICLEI 2012), wastewater is identified as an optional emissions-generating activity for reporting. As noted by ICLEI, treatment may consist of a diversity of approaches with varying impacts

on emissions, from conventional treatment, to additional systems that provide nitrification and denitrification services, to lagoons and septic tanks. The protocol provides a recommended method for attributing community emissions to a local government based on the number of people served by the treatment facility. However, as noted above, this approach is problematic for the County of San Mateo, where the County can neither identify the service population by facility or detailed characteristics of each facility.

- **Emissions from Caltrain routes within the incorporated and unincorporated county.** Although Caltrain operates within San Mateo County, routes only pass briefly through unincorporated areas without any stops in unincorporated areas. Due to these characteristics, this emissions sector has been excluded due its negligible relevance and contribution of GHGs.
- **Emissions from airport take-offs and landings in the unincorporated county.** The Half Moon Bay Airport is located within unincorporated land and is operated by the County of San Mateo. However, emissions information was not available for takeoffs and landings at this airport. San Francisco Airport (SFO) is also located in unincorporated San Mateo County, but it is operated by the City and County of San Francisco, which has primary regulatory authority over land use at SFO. SFO has a separate climate action planning effort. For these reasons, these two airports were excluded from this inventory.

Stationary source and direct landfill emissions have also been examined in this emissions inventory. Stationary sources are defined as any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food processing plants, and other heavy industrial sources. The BAAQMD provided a list of stationary source emissions within the County of San Mateo totaling 10 MTCO₂e in 2005. Direct landfill emissions include methane emissions from waste generated both within and outside of the unincorporated county. Four landfills lie within the unincorporated county. Of these landfills, only two are operational. Data on emissions was available for two landfills: the operational Ox Mountain Sanitary Landfill and the closed Pescadero Landfill, which totaled 123,000 MTCO₂e. Together, stationary source and direct landfill emissions totaled 123,010 MTCO₂e in 2005. **Table D-2** presents these totals below.

Table D-2. 2005 Community-Wide Baseline Emissions by Sector, Including Stationary Sources and Direct Landfill Emissions

| Sector | Metric Tons CO ₂ e/year | Percentage of Total |
|----------------------------------|------------------------------------|---------------------|
| Transportation | 479,400 | 52% |
| Commercial and Industrial Energy | 160,900 | 18% |
| Landfill | 123,000 | 14% |
| Residential Energy | 93,100 | 10% |
| Off-Road | 35,800 | 4% |
| Solid Waste | 8,380 | 1% |
| Agriculture | 3,000 | <1% |
| Water and Wastewater | 1,500 | <1% |
| Stationary | 10 | <1% |
| TOTAL | 905,090 | 100% |

Stationary source emissions and direct landfill emissions are included in the GHG emissions reduction strategy for informational purposes only, as stationary source emissions are most effectively addressed and regulated by the BAAQMD or through federal and state programs. Direct landfill emissions also include waste generated from outside the unincorporated county, over which San Mateo County has little control. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the County's control; therefore, stationary source and direct landfill emissions are excluded from all further discussions of the inventory for the purpose of setting accurate emissions reduction targets.

GHG EMISSIONS PROJECTIONS

The basis for all growth scenarios is a business-as-usual (BAU) projection. The BAU projection forecasts emissions to reflect the County's growth projections without regulatory or technical intervention to reduce GHG emissions. VMT projections are derived from Fehr & Peers' analysis of the City/County Association of San Mateo County (C/CAG) travel Demand Model for a trip-based transportation forecast (refer to **Appendix B**). The business-as-usual forecast for all other sectors rely on the demographic projections from the Association of Bay Area Governments (ABAG) 2009 regional forecasts (see **Table D-3**).

Table D-3. San Mateo Community Growth Indicators

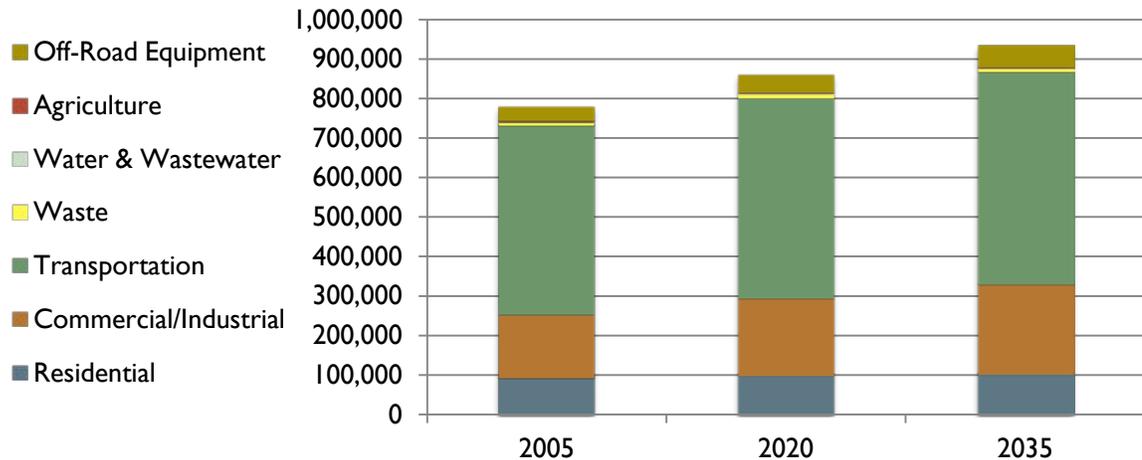
| | 2005 | 2010 | 2020 | 2035 |
|--------------------|---------|---------|---------|---------|
| Population | 63,600 | 65,400 | 68,900 | 71,300 |
| Households | 21,300 | 21,780 | 23,000 | 23,830 |
| Employment | 44,280 | 46,430 | 53,550 | 62,280 |
| Service Population | 107,880 | 111,830 | 122,450 | 133,580 |

These indicators are then applied to the 2005 GHG emissions inventory to determine a business-as-usual growth scenario. Under the business-as-usual scenario, community-wide emissions will grow by approximately 10% by the year 2020 to 860,800 MTCO₂e and by 19% by 2035 to 934,300 MTCO₂e, as shown in **Table D-4** and **Figure D-2**.

Table D-4. San Mateo Community GHG Emissions Forecast

| Sector | 2005 Baseline | 2020 | 2035 |
|----------------------------------|---------------|---------|---------|
| Transportation | 479,400 | 506,800 | 534,200 |
| Commercial and Industrial Energy | 160,900 | 194,600 | 226,300 |
| Residential Energy | 93,100 | 100,500 | 104,200 |
| Off-Road | 35,800 | 44,600 | 53,900 |
| Solid Waste | 8,380 | 9,500 | 10,400 |
| Agriculture | 3,000 | 3,100 | 3,400 |
| Water and Wastewater | 1,500 | 1,700 | 1,900 |
| TOTAL | 782,080 | 860,800 | 934,300 |
| Percentage Change from 2005 | | 10% | 19% |

Figure D-2. Business-As-Usual GHG Forecast 2005–2035



* Other sources include water and wastewater, agriculture, and off-road emissions representing less than 2% of the inventory.

In addition to Assembly Bill (AB) 32, California has adopted and started to implement several state-level programs that will impact local GHG emissions. In order to effectively determine the emissions reductions that will need to be implemented at the local level to meet the County’s emissions reduction target, the impact of state-level programs has been incorporated into an adjusted business-as-usual forecast. The state-level programs included in this adjusted forecast include the Renewables Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of the Clean Car Fuel Standard, commonly referred to as the Pavley standards. The impact of these state programs (shown in **Table D-5**) will play a critical role in helping San Mateo achieve the emissions reduction target.

Table D-5. State Reductions Summary

| | 2005 | 2020 | 2035 |
|-------------------------------------|---------|----------|----------|
| Business-As-Usual Emissions | 782,080 | 860,800 | 934,300 |
| Renewables Portfolio Standard (RPS) | - | -4,500 | -13,300 |
| AB 1493 (Pavley) Vehicle Standards | - | -130,700 | -194,700 |
| California Solar Initiative (CSI) | - | -300 | -200 |
| CALGreen Building Standards | - | -10,900 | -17,000 |
| Subtotal State Reduction Efforts | - | -146,400 | -225,200 |
| Net Emissions | - | 714,400 | 709,100 |
| Percentage Change from 2005 Levels | - | -9% | -9% |

GHG EMISSIONS REDUCTION TARGET

The County of San Mateo is following state guidelines by seeking to achieve a GHG emissions reduction target of 15% below 2005 baseline levels by 2020.

The GHG reduction measures included in this EECAP demonstrate the County's ability to reach the GHG reduction target of 15% below 2005 levels by 2020. Emissions reductions were quantified for two different years: 2020 and 2035. The 2020 and 2035 emissions reductions are the potential reductions that will be achieved through the implementation of these measures. The GHG reduction strategies are separated by goal or topic area to correspond with the sectors and sources of GHG emissions as follows in **Figure D-3**:

Figure D-3. GHG Reduction Topics



It is important to identify how the County will meet or exceed the minimum GHG reduction target of 15% below baseline levels by 2020 to ensure the County can utilize the EECAP as a Qualified GHG Reduction Strategy for use in environmental review of projects. This Plan identifies a clear path to allow the County to reach the community-wide GHG reduction target of 15% below baseline levels which, in turn, meets the state targets as well.

The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs. The reduction measures aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, existing actions, state programs, and GHG reduction measures in the EECAP will reduce GHG emissions in the unincorporated county in 2020 by 213,400 MTCO₂e. As shown in

Table D-6, local reductions will contribute 67,000 MTCO₂e by 2020. Local actions from this Plan contribute 31% of total progress toward the County's reduction target (see **Figure D-4**). The remaining 69% of reductions result from state programs. Together, these reductions achieve a 17% decrease by 2020, exceeding the AB 32 target for 2020. Total reductions by EECAP goal topic are shown in **Figure D-5**.

Table D-6. Local GHG Reduction Summary by Topic (MTCO₂e)

| Goal Topic | 2020 | 2035 |
|-------------------------------------------------|---------------|----------------|
| Residential Energy Efficiency | 5,630 | 10,590 |
| Commercial Energy Efficiency | 15,580 | 43,490 |
| Green Building Ordinance | 6,780 | 69,270 |
| Renewable Energy | 6,480 | 35,420 |
| Transportation | 7,100 | 6,400 |
| Alternative Fuels | 1,780 | 2,200 |
| Waste Diversion | 15,010 | 22,140 |
| Water Conservation | 170 | 200 |
| Sustainable Agricultural Practices ¹ | - | - |
| Off-Road Technologies | 8,470 | 16,740 |
| Sequestration ¹ | - | - |
| Totals | 67,000 | 206,450 |

1. Not quantified; supportive goal topics.

Figure D-4. Local and State Reductions (MTCO₂e)

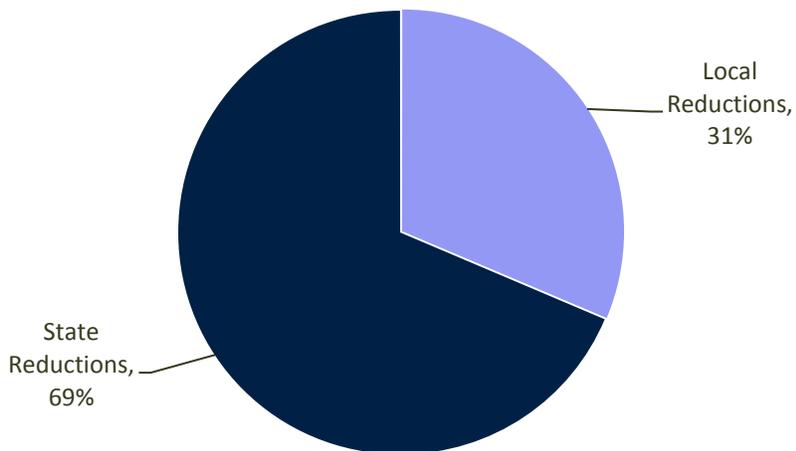
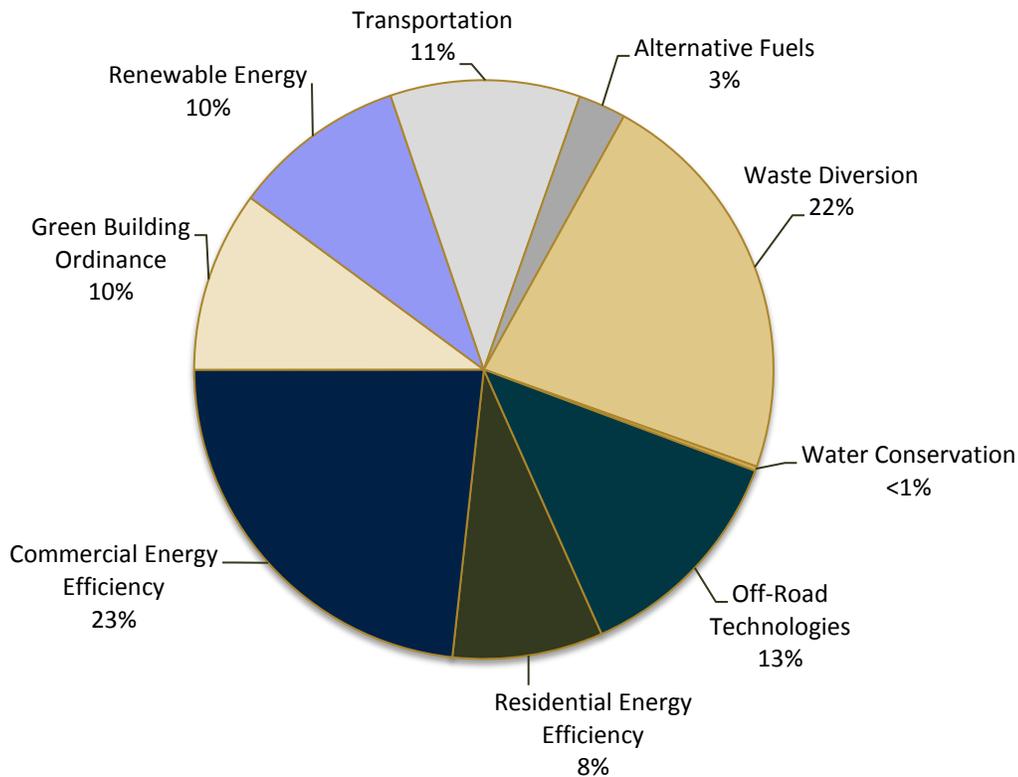
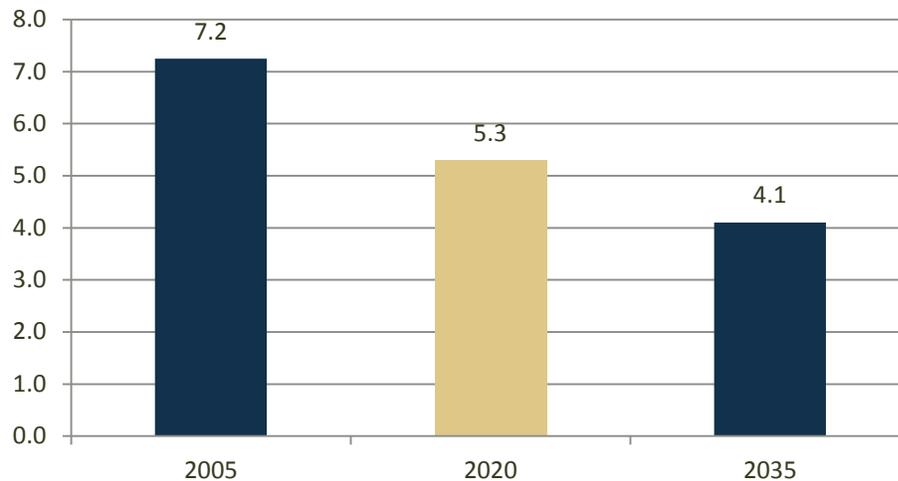


Figure D-5. 2020 Emissions Reductions by Goal (MTCO₂e)



Achievement of the County's adopted target by 2020 will meet state recommendations and BAAQMD threshold requirements for developing a Qualified GHG Reduction. As shown in **Figure D-6**, through the implementation of this Plan, the County's GHG emissions will decrease from 7.2 MTCO₂e per person per year in 2005 to 4.1 MTCO₂e per person per year in 2035.

Figure D-6. GHG Emissions per Service Population (MTCO₂e)



In addition to quantifying the emissions reductions associated with each strategy in the EECAP, BAAQMD guidance recommends that the County clearly specify the measures within the EECAP applicable to new construction projects to demonstrate compliance with the County's GHG emissions reduction strategy and determine that the project's GHG emissions are less than significant. To ensure that each new construction project complies with the County's EECAP, a checklist has been developed to be submitted by an applicant for each new development project (see **Appendix F**).

IMPLEMENTATION AND MONITORING

To ensure the timely implementation of the County's EECAP, the County will identify staff to coordinate track implementation of GHG reduction strategies and progress toward GHG reduction targets, and prepare biannual reports to the Board of Supervisors on EECAP implementation and progress. To assist in this reporting, the County has developed an implementation and monitoring tracking tool that identifies the major implementation milestones and the necessary actions to be taken for each measure. The tool enables the County to quickly update the GHG emissions inventory and streamline the reporting of EECAP implementation on an annual or biannual basis. The monitoring tool also outlines the necessary procedures to update the inventory and reduction measures every 3–5 years. This tool that will serve as the primary instrument in measuring the County's progress toward achieving emissions reduction targets and to ensure timely implementation occurs.

PUBLIC PROCESS AND ENVIRONMENTAL REVIEW

The final component of a Qualified GHG Reduction Strategy is to adopt the plan through a public hearing process following environmental review. The County has involved numerous stakeholders throughout the development of the EECAP. The EECAP will undergo environmental review as part of the public hearing and adoption process.

During the development of the EECAP, the County engaged stakeholders and interested community members through multiple mechanisms, including workshops, working group meetings, presentations, one-on-one meetings, and a website. The project website provided ongoing information and access to documents during EECAP development, offered an opportunity to sign-up for e-mail updates, and hosted a survey. The County convened three stakeholder working groups to solicit input and feedback from County staff, building, public health, housing, and other local groups. These working groups included a Technical Advisory Committee (consisting of County government staff), a Steering Committee (consisting of members of the public, partner agencies, and County staff) and an adaptation working group (consisting of community and county representatives). The public also had opportunities to review and provide comments through the public hearing processes of the Planning Commission and Board of Supervisors.

In order to operate effectively as a programmatic tiering document, the California State Office of the Attorney General and the BAAQMD both recommend integration of components of the GHG emissions reduction strategy into the General Plan. The County is accomplishing this through a General Plan amendment as part of EECAP implementation. The General Plan will be updated to provide overarching goals and policies to reduce GHG emissions consistent with the County's GHG reduction target and to prepare and respond to the potential impacts of climate change in the unincorporated county.

The County has prepared an environmental impact report for this project, in compliance with the California Environmental Quality Act, finding that the CAP will have a less than significant environmental impact for all impacts analyzed, except for a potentially significant impact on natural habitat areas, sensitive species, and wildlife corridors. . The EECAP is a strategy to reduce overall GHG emissions in the unincorporated county and to mitigate potential GHG emissions resulting from new projects during the planning horizon.

REFERENCES

ICLEI – Local Governments for Sustainability. 2012. US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. Public Comment Draft. www.iclei.org.

San Mateo County. 2011. Wastewater Background Issues. http://www.co.sanmateo.ca.us/planning/genplan/pdf/gp/GP%20Ch%2011_Wastewater.pdf.

APPENDIX E: WORKING ADAPTATION PROGRAM

This appendix presents a working program to achieve the County's adaptation strategy presented in **Chapter 5** of the Energy Efficiency Climate Action Plan. The following matrix provides information to guide implementation of the County's adaptation strategy, including identification of lead agencies as well as additional potential implementation details for the adaptation strategies presented in **Chapter 5**. Building on the findings of the San Mateo County Vulnerability Assessment, this matrix presents topics, asset categories, and vulnerabilities in San Mateo County. Recommendations were developed in collaboration with the San Mateo County Vulnerability Assessment Working Group. Note that this matrix reflects the broader regulatory framework for adaptation, including actions for key County agencies in addition to regional, state, and federal partners. Providing this framework helps County staff to track parallel planning efforts and opportunities for collaboration. This matrix is a working document intended for ongoing refinement during the life of this Plan.

APPENDIX E: WORKING ADAPTATION PROGRAM

ADAPTATION MATRIX: POTENTIAL CLIMATE CHANGE ADAPTATION STRATEGIES

| | | Tools | | | |
|----------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| Agriculture | <u>Agriculture</u> | Changes in precipitation and weather may result in changes in crop selection and will result in the need for greater crop management. | County Planning & Farm Bureau | <p><u>General Plan</u> Develop policies to support local agricultural production through appropriate land use designations and policies.</p> <p><u>Zoning Code</u> Allow for productive land dedicated to agriculture.</p> | <p><u>Education</u> Develop an educational program related to water conservation and management.</p> <p><u>Agricultural Management Plan</u> Work with the agricultural community to encourage a long-term plan to manage resources and address habitat considerations.</p> |
| Forestry | <u>Forestry</u> | Forest health could be negatively impacted by lower rainfall levels and higher temperatures. | County Planning & Open Space District, County Department of Parks | <p><u>General Plan</u> Support long-term resource management plans through appropriate land use designations and policies.</p> <p><u>Zoning Code</u> Allow appropriate uses on land</p> | <p><u>Local Hazard Mitigation Plan</u> Coordinate an update to the County's Local Hazard Mitigation Plan to minimize risks to life, property, and natural systems.</p> <p><u>Resource Management Plan</u> Work with the property owners to develop a long-term plan to manage forest resources, maintain healthy forests, and address habitat considerations.</p> |

APPENDIX E: WORKING ADAPTATION PROGRAM

APPENDIX E

| | | Tools | | | |
|----------------|------------------------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | dedicated to forestry. Prepare and implement a Long-Term Resource Management Plan that accounts for anticipated climate changes. | | |
| Community | <u>The Built Environment</u> | County Planning, Building, & Public Works Departments | <u>General Plan</u> Establish a strategy for addressing development that is vulnerable to climate change. Consider policies to protect the County against liability associated with projects that may be at risk from climate change. <u>Emergency Operation Plans</u> Update plans to address areas of vulnerability. <u>Defensive Strategies</u> | <u>Zoning Code</u> Consider minimum standards for areas subject to inundation for the following: Finished floor elevations. Setbacks from areas of inundation and bluff erosion zones. <u>CEQA Guidelines</u> Establish local CEQA guidelines that require analysis of potential climate change impacts. <u>Flood Zones</u> Evaluate existing flood zone areas and | <u>Development Review</u> Apply policies and standards to new and existing development through: Land use entitlements (e.g., subdivision map, improvement plans) Building permit <u>Risk Assessment & Liability</u> Identify strategies to minimize liability. Consider requiring liability waivers from projects in areas expected to be impacted by climate change. |

APPENDIX E: WORKING ADAPTATION PROGRAM

| | | Tools | | | |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | Coyote Point Marinas Seal Cove Bluff Earthquake risk could change for homes and businesses due to changing groundwater table. | | Develop a strategy for protecting facilities & improvements against changes in sea level. <u>Local Coastal Program</u> Future update of the Local Coastal Program to reflect Coastal Commission policies. | recommend adjustments as appropriate to include vulnerable areas. Review existing storm event and flood zone areas and recommend updates as appropriate to address the potential impacts of climate change. <u>Infrastructure Plans</u> Upgrade plans to include adaptation considerations: Storm drain plan to address changes in precipitation. | <u>Bay Plan</u> Work with BCDC to evaluate policies related to climate change and adaptation. <u>Coastal Act</u> Coordinate with the Coastal Commission to evaluate coastal policies to address climate change. |
| | | State | | | |
| | | Federal | <u>Federal Insurance Rate Maps (FIRM)</u> Work with FEMA to review and adjust, if appropriate, FIRMs to account for the potential local impacts of climate change. | Water & wastewater plans to address changes in sea level/ground water table. Transportation plans to avoid/protect areas subject to flooding & erosion. <u>Capital Improvement</u> | |

APPENDIX E: WORKING ADAPTATION PROGRAM

APPENDIX E

| Tools | | | | | |
|----------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | | <p><u>Program (CIP)</u> Include adaptation considerations in annual CIP to: Identify improvements to address climate change (e.g., cooling stations, shoreline buffering, and infrastructure relocation). Install appropriate flood protection measures.</p> | |
| Community | <u>Recreation</u> | <p><u>Recreation</u> Marinas could see boats and facilities destroyed from higher high tides and storm waves on top of sea level rise. Pillar Point Marina Oyster Point Marina Coyote Point Marina Public access and recreation could be impaired by loss of beaches, trails, and flooding of parking</p> | <p>County Parks, Harbor District</p> | <p><u>General Plan</u> Consider establishing policies to protect recreation facilities and public access from climate change.</p> | <p>See recommendations for the Built Environment.</p> |
| | | <p>State</p> | <p><u>Bay Plan</u> Work with BCDC to identify a strategy for protecting recreation areas from changes in sea level, inundation, and</p> | <p>See recommendations for the Built Environment.</p> | <p><u>Educational Programs</u> Explore opportunities to provide interpretive and educational information about climate change in recreation areas. <u>Management Plan</u> Update management plans for recreation and open space areas to respond to the anticipated effects of climate change and explore opportunities to create buffers to changes in sea level.</p> |

APPENDIX E: WORKING ADAPTATION PROGRAM

| | | Tools | | | |
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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | lots. Coyote Point Recreation Area Promenade storm surge. <u>Coastal Act</u> Recommendations for the built environment to include recreation. | See Recommendations for the Built Environment. <u>Capital Improvement Program</u> Include changes in sea level and storm activity as considerations in funding recreation improvements. | |
| Community | <u>Transportation</u> Transportation facilities may be subject to inundation and erosion: RTE 1 and 101 Caltrain Local Roads & Transit Airports could be impaired by changes in sea level and increased storm events: San Francisco | County Planning & Public Works Departments | <u>General Plan</u> Establish a strategy to protect infrastructure located in low-lying areas that will be subjected to inundation. Develop policies that favor natural shoreline protection over armoring. | <u>Pump Operations</u> Consider enhancing local pump capacities (e.g., at San Carlos Airport) to manage flood risk. <u>Improvement Plans</u> Upgrade design standards to account for changes in sea level and storm activity. | Coordinate with transportation agencies to preserve access by planning for climate change. <u>Climate Action Plan</u> Coordinate with regional transportation agencies (e.g., Port of San Francisco, Caltrans, MTC, Caltrain) to preserve access and circulation in spite of anticipated climate changes to sea |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | International Half Moon Bay San Carlos | State | | <p><u>Improvement Plans</u> County transportation facilities should be designed to locate in areas that are not subject to inundation and storm surges.</p> | <p>level and storm activity.</p> <p><u>Bay Plan</u> Coordinate with BCDC for protection of transportation facilities and airports that are located within the 100-foot shoreline band.</p> <p><u>Caltrans</u> Work with Caltrans to develop infrastructure protection policies and design standards that account for climate change.</p> <p><u>Management Plans</u> Create strategies for protecting existing and planned facilities that may be subject to inundation, storm surges, and erosion due to changes in sea level and storm activity.</p> |
| | | Federal | <p><u>MTC</u> Coordinate with MTC to create policies that</p> | <p><u>Regional Transportation Plan</u> Coordinate with regional agencies to</p> | <p>Participate in regional efforts to plan for airport capacity. Develop a position on</p> |

APPENDIX E: WORKING ADAPTATION PROGRAM

| Asset Category | | Area of Vulnerability | Lead Agency | Tools | | |
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| | | | | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| Infrastructure | Sea Walls | Levees and sea walls could experience increased damages from sea level rise and erosion. | County Planning & Public Works Departments | include climate change consideration in funding decisions. <u>Federal Insurance Rate Maps</u> Work with FEMA to identify transportation facilities including airports that are located in vulnerable areas, including 100- to 200-year flood elevation areas. | include climate change considerations in establishing funding priorities. | preferred approaches to maintaining airport facilities (e.g., passive controls, upgrade pumps, levee protection). |
| | | | | State | <u>General Plan</u> Establish policies governing the appropriate use of sea walls and levees. Develop policies that favor natural shoreline protection over armoring. <u>Bay Plan</u> | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | <p>Recommendations for the built environment to include shoreline protection.</p> <p><u>Coastal Act</u></p> <p>Recommendations for the built environment to include shoreline protection.</p> | <p>Coordinate with BCDC regarding shoreline protection in the bay.</p> <p><u>Local Coastal Program</u></p> <p>Coordinate with the Coastal Commission regarding shoreline protection of outer coast.</p> | eligible for federal funding and coordinate with federal partners. |
| | | Federal | <p><u>US Army Corps of Engineers</u></p> <p>Coordinate with the US Army Corps of Engineers to establish a shoreline protection strategy.</p> | | |
| | | State | <p><u>Regional Water Quality Control Board</u></p> <p>Coordinate with the regional water quality control board to ensure adequate water quality given anticipated</p> | | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions | |
| | | | changes in sea level and storm surges. | | | |
| | | State | <u>Cal Fire</u> Coordinate with the State regarding fire protection services. | | Enforce fire safety standards. | |
| Resources | <u>Wetlands</u> Coastal and bay wetlands will be lost because they are not able to keep up with sea level rise or migrate inland. <u>Tidal Areas</u> Wetlands in Pescadero Marsh, Pillar Point Marsh <u>Beaches</u> Tidal pools could be lost due to bluff erosion or other sea level rise impacts. Fitzgerald Marine Reserve <u>Beaches</u> Where beaches | County Planning & Parks Departments | <u>General Plan</u> Establish policies to support sediment management and to protect shoreline resources. <u>Climate Action Plan</u> Create policies that would protect wetlands for carbon sequestration benefits and to function as buffers from sea level rise as well as potentially provide | | <u>Shoreline Management</u> Work with regional agencies to develop a Regional Sediment Management Plan. Develop monitoring and adaptive management program. Coordinate with California state parks and both state and federal regulatory agencies to discuss solutions for the management of the Pescadero Marsh. | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | cannot move inland with higher tides, there could be loss of these ecosystems. Surfers Beach at Highway 1 is currently eroding | State | <p>for their inland migration.</p> <p><u>Bay Plan</u> Work with BCDC to prepare a Regional Sediment Management plan to ensure dredgers comply with the Long-Term Resource Management Plan.</p> <p><u>Local Coastal Program</u> Future update of the Local Coastal Program to reflect Coastal Commission policies related to sediment management and coastal wetlands.</p> <p><u>Coastal Act</u> Coordinate with the Coastal Commission to</p> | | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | develop a Regional Sediment Management plan for outer coast and protect wetlands as a natural buffer against sea level rise. | | |
| | | Federal | <p><u>EPA</u> Coordinate with the EPA to protect endangered species habitat.</p> <p><u>US Army Corps of Engineers</u> Coordinate with the Corps to create a Regional Sediment Management plan for the coast and the bay.</p> <p><u>National Oceanic and Atmospheric Administration</u> Coordinate with NOAA to create a Regional Sediment</p> | | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions | |
| | | | Management program. | | | |
| Fire | <u>Vacant Lands</u> | Unimproved lands, especially on the urban-rural boundary, could see more fire events. Pescadero Park Complex, Huddart/Wunderlich Park Complex (60-acre area) | County Fire Department Open Space District | <p><u>General Plan</u> Create policies that allow for adequate water supply to help manage fire risk. Establish policies to protect the County against liability associated with projects that may be at risk from climate change.</p> <p><u>Zoning/Building Codes</u> Require fire-resistant designs and materials in the urban woodland interface areas.</p> <p><u>Climate Action Plan</u> Promote resource management (especially for the</p> | <p><u>Emergency Operations Plan (EOP)</u> Update the EOP to account for increased vulnerability related to climate change. Consider modifications to operations that may include: Improving fire risk standards. Increasing firefighting infrastructure. Expanding enforcement of fire safe standards.</p> <p><u>Vegetation Management</u> Establish vegetation management programs to reduce fire risks and improve the County's ability to adapt to changes in vegetation and more extreme weather conditions.</p> | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | watershed land) to reduce fire probability. | | |
| | | State | <u>Cal Fire</u> Coordinate with the State regarding fire protection services. | | |
| Fire | <u>Developed Lands</u> Homes, lives, and property, especially in highly developed canyons with limited access, could be lost due to increased incidence of fire. Mirada Surf East, Quarry Park, La Honda, Pacifica, Granada, Devonshire Canyon, Emerald Lakes Hills area | County Planning | <u>Climate Action Plan</u> Promote policies that improve emergency vehicle access and address roadside vegetation management. | | |
| | | State | <u>Cal Fire</u> Coordinate with the State regarding fire protection services. | | |
| | | Federal | Coordinate fire protection services with FEMA. | | |
| Fire | <u>Resources</u> Sensitive habitats may be lost or | County Planning and | <u>General Plan</u> Create policies that | <u>Vegetation Management</u> | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions | |
| | | destroyed due to increased fire incidences. Mission Blue, Bay Checkerspot, Callippe, and San Bruno Elfin butterflies, Coho salmon, steelhead trout, red-legged frog, San Francisco garter snake, tiger salamander, tidewater goby, and a variety of birds | Fire Departments | allow for adequate water supply to help manage fire risk. <u>Climate Action Plan</u> Prepare a resource management plan (especially for the watershed land) to reduce fire probability while preserving sensitive habitats. | Establish vegetation management programs to reduce fire risks while preserving sensitive habitats. | |
| Fire | <u>Infrastructure</u> | Water supply and associated infrastructure could be destroyed by wildfires. Crystal Springs watershed | County Planning & Public Works | <u>Climate Action Plan</u> Update emergency response plans to account for increased vulnerability related to climate change. | Coordinate with the Crystal Springs Regional Park and the San Francisco Public Utilities Commission to ensure that facility management accounts for anticipated climate change. | |
| | <u>Heat Exposure</u> | <u>Heat Exposure</u> Citizens may experience greater health risks in outdoor recreation areas, particularly if | County Health & Public Works Departments | <u>Climate Action Plan</u> Support preparation of project-level and programmatic | <u>Health Impact Assessment (HIA)</u> Prepare an HIA that includes increased heat exposure from climate change among the | <u>Capital Improvement Program</u> Include capital improvement projects on the CIP that may include: Multiuse/purpose cooling |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | health impact assessments to identify specific areas of vulnerability and specific projects and programs that may address public health vulnerability. | factors evaluated. | centers, especially for vulnerable populations such as elderly people and children. Landscape programs to install shade trees <u>Education</u> Educate recreational users about the risks of high heat days with materials in languages that they speak. |
| Health | <u>Vulnerable Populations</u> People with impaired respiratory systems will see higher hospitalization rates and mortality rates with reductions in air quality. Children and elderly populations may be threatened by increases in the number and extent of extreme heat | County Health, Planning, & Public Works Departments | <u>Climate Action Plan</u> Support preparation of project-level and programmatic health impact assessments to identify specific areas of vulnerability and specific projects and programs that may address public health vulnerability. | <u>Capital Improvement Program</u> Include capital improvement projects on the CIP that may include cooling centers, especially for vulnerable populations such as people with respiratory problems. | <u>Education</u> Implement public education programs to: Inform vulnerable populations about air quality issues and potential responses to deteriorating air quality. Create a “support system” to provide assistance to respond to extreme heat and poor air quality events. |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | events. Individuals with limited mobility will not be able to access cooling facilities. | | <u>Health Impact Assessment (HIA)</u> Prepare an HIA that includes deteriorating air quality as the result of climate change among the factors evaluated. | | |
| | | State | <u>Bay Area Air Quality Management District (BAAQMD)</u> Coordinate with BAAQMD to support continued implementation of the Clean Air Plan. | | <u>Enforcement</u> Enforce air quality regulations. |
| Health | <u>Socioeconomic Considerations</u> Low-income residents may be threatened by extreme heat events due to their limited ability to cool their homes. Diverse communities | County Health, Planning, & Public Works Departments | <u>General Plan</u> Establish policies to ensure that social equity issues are considered when planning for climate change. | <u>Capital Improvement Program</u> Include capital improvement projects on the CIP that may include cooling center in low-income communities. | <u>Education</u> Implement education programs to: Inform vulnerable populations about cooling facilities. Provide information in various languages spoken in the county. |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | with language barriers may not be able to understand emergency procedures and evacuation communications. | | | | |
| Health | <u>Facilities</u> Seton Medical Center is surrounded by creeks. | County Health, Planning, & Public Works Departments | <u>General Plan</u> Establish policies to promote site selection and design of medical facilities that considers vulnerabilities to climate change. | <u>Capital Improvement Program</u> Include appropriate infrastructure to protect emergency facilities against vulnerability including: Drainage systems on both private and public property. Levees and creek protection, as necessary, for hospitals to minimize flooding. <u>Emergency Operations Plan (EOP)</u> Update the EOP to address anticipated vulnerabilities that could result from | Facility Management Prepare a facility management plan that incorporates: "Surge capacity" in health care facilities to address increased demand during heat events. An inventory of essential infrastructure (emergency facilities, emergency response routes, water supplies, wastewater disposal, etc.) Actions needed to preserve the ability to respond to storm events, increased medical needs, flooding, and fire. A recovery plan to address clean-up, debris |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | | climate change. | management following storm, flooding and/or fire events. |
| | | Federal | <u>FEMA</u> Coordinate emergency preparedness plans to ensure that emergency preparedness includes climate change as a consideration. | | |
| Water | Water Supply Water districts that rely on surface waters could experience increased disruption from changing precipitation: Small County-run district east of Memorial Park Infrastructure in the coastal zone may be damaged by increased storm events. | County Health, Planning, & Public Works Departments | <u>Climate Action Plan</u> Establish policies to promote water conservation and water efficiency. Promote coordination with the water district to ensure adequate water supply and water quality given anticipated changes in the climate. | <u>Inventory Management Plan</u> Prepare an inventory of water supply, storage, and distribution facilities to identify specific facilities that may be vulnerable to changes in sea level, storm events, or fire. <u>Management Plan</u> Develop a water management strategy that includes consideration of conservation, recycling, | <u>Urban Water Management Plan</u> Encourage water providers to establish a plan to protect existing supplies. |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | <p><u>General Plan</u></p> <p>Establish policies to promote water conservation.</p> <p>Expand storage for low-water supply years.</p> | <p>and increased storage capacity.</p> <p><u>Capital Improvement Program</u></p> <p>Include consideration of climate change when planning capital projects.</p> | |
| Wastewater | <p>Sewer systems could experience backup, and sewer districts could experience localized flooding due to sea level rise. (Note: Sewer systems located outside of the county could impact the county if they fail.)</p> <p>Memorial Park Wastewater Treatment Plant</p> | <p>County Environmental Health & Public Works</p> | <p><u>Regional Water Quality Control Board</u></p> <p>Coordinate with the water control board to protect water quality.</p> | <p><u>County Environmental Health Department</u></p> <p>Evaluate septic permit regulations to ensure they are adequate to address surface and groundwater issues given the anticipated changes in the water table and precipitation.</p> <p><u>Capital Improvement Program</u></p> <p>Design planned capital projects for adaptation.</p> <p>Inventory existing plants to identify necessary improvements to ensure safe disposal of wastewater given</p> | |
| | | <p>State</p> <p>Federal</p> | | | |

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| Asset Category | Area of Vulnerability | Lead Agency | Priority Adaptive Capacity Actions | Priority County Operational Actions | Ongoing Supportive Actions |
| | | | | anticipated changes in sea level and storm events. Consider replacements/upgrades of wastewater system as needed in appropriate locations. | |

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APPENDIX F: EECAP DEVELOPMENT CHECKLIST



To ensure new development projects are compliant with the County's Energy Efficiency Climate Action Plan (EECAP), the following checklist has been developed. This checklist should be filled out for each new project, addition, or remodel that is subject to discretionary review to allow projects to identify consistency with the EECAP. Demonstrating consistency with the EECAP shows project eligibility for CEQA tiering, as provided for by the California Environmental Quality Act (CEQA). Tiering from the environmental analysis prepared for this EECAP may allow projects to streamline project review, with the potential to use the EECAP to determine the project would have less than significant impact on greenhouse gas emissions.

The EECAP provides both mandatory and voluntary greenhouse gas reduction measures with varying applicability for different types of future projects. If a project desires to use the EECAP for CEQA streamlining provisions, the County will be responsible for applying voluntary and/or mandatory measures as mitigation measures, as appropriate. The County will work with applicants on a project-by-project basis to determine the appropriate use of the CEQA benefits of the EECAP, identifying appropriate mandatory and voluntary measures to integrate into project design or mitigation. For developments wishing to benefit from CEQA streamlining provisions, the County may require voluntary measures in this EECAP as mandatory conditions of approval or as mitigation in a mitigated negative declaration or an environmental impact report, as appropriate, on a project-by-project basis. This approach allows the County to ensure that new development can benefit from CEQA streamlining provisions while also ensuring that the County is on target to achieve the reduction targets outlined in this Plan. The checklist does not preclude the County's discretion to determine if substantial evidence indicates that a project complying with EECAP measures may still yield cumulatively considerable impacts on the environment. If the County finds that a project may still yield cumulatively considerable impacts despite compliance with the EECAP, an environmental impact report (EIR) must be prepared for the project.

Note that this checklist excludes supportive and non-quantifiable measures identified in the EECAP, or measures that are not universally applicable to all projects. In addition, the checklist provides the quantitative

criteria as it would be applicable to a single project. This criteria is intended to provide clarity for implementation of the EECAP, in some instances providing additional information that is consistent with the assumptions identified in **Appendix C** of the EECAP. The actions identified in the checklist below show the level of project performance that would demonstrate consistency with the EECAP and support consistency with the findings of the EECAP's CEQA analysis. For projects that may comply with the intent of an EECAP action but not meet all identified performance criteria below, County staff has the flexibility to determine on a case-by-case basis when projects nonetheless demonstrate consistency with the overall intent of the EECAP.

Specifically, the checklist excludes the following:

- Measures that describe County efforts supportive of other measures, that will not be implemented project-by-project, including Measure 3.4 (Expedited Permitting), Measure 5.2 (County Impact Fees), Measure 10.2 (Alternative Fuel Outreach) and Measure 4.8 (Community Choice Aggregation). These measures describe the County's efforts to create an enabling framework for projects, and which projects will implement through the other actions described in the following checklist.
- Measures that are supportive, whose impacts on GHG emissions were not quantified and did not contribute to the environmental determination of the EECAP's EIR. These measures will be implemented through broad public-private partnerships and not on a project-by-project basis, including Measure 2.4 (Green Business Program), Measure 2.5 (Implement AB 1103), and Measure 11.1 (Energy-Efficient Agriculture).
- Large-scale measures that are specific to unique types of large projects, including Measure 4.6 (Commercial Wind Power) and Measure 4.10 (Waste to Energy). These measures describe large-scale projects not eligible for CEQA streamlining, whose impacts will be dependent upon project specifics that could not be anticipated through the EECAP's EIR. These projects cannot benefit from the CEQA streamlining provisions of this EECAP, and will require separate environmental analysis pursuant to CEQA.

EECAP DEVELOPMENT CHECKLIST

| Measure | | Description & Performance Criteria | Compliance | | | |
|---------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|-----|----------------|
| | | | Complies | Does Not Comply | N/A | See Discussion |
| 1.1 | Energy Upgrade California | Participate in an energy retrofit rebate program, to achieve a minimum of 30% energy savings. | | | | |
| 1.2 | Residential Energy Efficiency Financing | Participate in a residential energy efficiency financing program, to achieve 30% energy savings. | | | | |
| 1.3 | Low-Income Weatherization | Complete weatherization, to achieve average energy savings of 25%. | | | | |
| 1.4 | Tree Planting | Tree plantings to shade new or existing homes. | | | | |
| 1.5 | Propane Switch | Switch from propane heater to more energy-efficient options, such as Energy Star furnaces or electric air-source pumps. | | | | |
| 2.1 | Commercial and Industrial Efficiency | Complete energy efficiency upgrades through third-party programs. | | | | |
| 2.2 | Commercial Financing | Participate in commercial energy efficiency financing programs, to achieve a minimum of 30% energy savings. | | | | |
| 2.3 | Institutional Energy Efficiency | Complete energy efficiency retrofits at large institutional facilities. | | | | |
| 3.1 | Green Building Ordinance | Comply with the Green Building Ordinance and achieve CALGreen Tier 1 energy efficiency standards, for all construction projects subject to the Green Building Ordinance. | | | | |

| Measure | Description & Performance Criteria | Compliance | | | | |
|---------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----|----------------|--|
| | | Complies | Does Not Comply | N/A | See Discussion | |
| 3.2 | Green Building Incentives | Comply with the Green Building Ordinance and achieve CALGreen Tier 1 energy efficiency standards, regardless of applicability of the Green Building Ordinance. | | | | |
| 3.3 | Urban Heat Island | Install shading, “cool” surfaces design, and/or open-grid paving to reduce hardscape through strategies such as interlocking concrete pavement, stones, or blocks. | | | | |
| 3.6 | Regional Energy Efficiency Efforts | Procure and install energy-efficient equipment, through programs such as bulk-purchasing, to achieve a minimum of 8% energy savings. | | | | |
| 4.1 | Solar PV Incentives | Install a solar photovoltaic system, using private resources and/or local or state incentives, including County incentives, and state rebates through the California Solar Initiative. | | | | |
| 4.2 | Solar Water Heater Incentives | Install solar water heaters, using private resources and/or local or state incentives, including County incentives and state rebates through the California Solar Initiative. | | | | |
| 4.3 | Pre-Wired Solar Homes | Pre-wire and pre-plumb for solar thermal or PV systems. | | | | |
| 4.4 | Pilot Solar Program | Install a solar photovoltaic system through a development project program. | | | | |
| 4.5 | Renewable Financing | Install a solar photovoltaic system or solar water heater using financing programs such as power purchase agreements or Property Assessed Clean Energy. | | | | |

APPENDIX F: EECAP DEVELOPMENT CHECKLIST

| Measure | | Description & Performance Criteria | Compliance | | | |
|---------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|-----|----------------|
| | | | Complies | Does Not Comply | N/A | See Discussion |
| 4.7 | Incentivize Wind Energy | Install small distributed generation wind power systems on existing development. | | | | |
| 4.9 | Emissions Offset Programs | Participate in an energy offset program to purchase electricity generated from renewable sources off site. | | | | |
| 5.1 | General Plan and Zoning Updates | Provide transit-oriented, mixed-use developments. | | | | |
| 5.3 | Pedestrian Design | Incorporate pedestrian design elements to enhance walkability and connectivity, while balancing impacts on vehicle congestion. | | | | |
| 6.1 | Neighborhood Retail | Provide neighborhood retail, daily service and commercial amenities in residential communities. | | | | |
| 6.2 | Traffic Calming in New Construction | Incorporate appropriate traffic-calming features, such as marked crosswalks, countdown signal timers, planter strips with street trees, and curb extensions. | | | | |
| 6.4 | Expand Transit | Enhance bus and safety shelter amenities to support public transit ridership. | | | | |
| 7.1 | Parking Ordinance | Provide staggered parking demand, reduced parking, or parking based on demand levels that is lower than required in the code, if supported by parking study findings or proximity to mixed-use and public transit services. | | | | |
| 7.3 | Unbundled Parking | Price parking separately from rentals or leases, using strategies such as metered parking or parking permits. | | | | |

| Measure | | Description & Performance Criteria | Compliance | | | |
|---------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|-----|----------------|
| | | | Complies | Does Not Comply | N/A | See Discussion |
| 8.1 | Employee Commute | Provide a Commute Trip Reduction program to discourage single-occupancy vehicle trips and encourage other modes of alternative transportation. | | | | |
| 8.2 | Workplace Parking | Implement workplace parking pricing programs. | | | | |
| 8.3 | Employer Transit Subsidies | Provide transit subsidies or transit passes to employees. | | | | |
| 8.4 | Work Shuttles | Expand worker shuttle programs. | | | | |
| 10.1 | Low Carbon Fuel Infrastructure | Install electric vehicle charging stations or provide neighborhood electric vehicle networks. | | | | |
| 13.1 | Use of Recycled Materials | Incorporate a minimum of 15% recycled materials into construction. | | | | |
| 13.2 | Zero Waste | Provide trash, recycling, and composting collection enclosures. | | | | |
| 14.1 | Smart Water Meters | Install smart water meters. | | | | |
| 14.2 | Water Reuse | Use grey, rain, and recycled water for landscaping or agricultural purposes. | | | | |
| 15.1 | Construction Idling | Construction equipment for new development to comply with best management practices from Bay Area Air Quality Management District guidance. | | | | |
| 15.2 | Electrification in New Homes | Provide outdoor electrical outlets for charging outdoor household equipment. | | | | |

Discussion (please list policy #)

