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# Revised Draft Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

REVISED DRAFT

# Climate Action Plan



# Acknowledgements

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# Acronyms and Abbreviations

°C	degrees Celsius
°F	degrees Fahrenheit
AB	Assembly Bill
ABAG	Association of Bay Area Governments
APG	California Adaptation Planning Guide
BAAQMD	Bay Area Air Quality Management District
BAU	Business-As-Usual
BMP	best management practices
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFC	chlorofluorocarbon
CH <sub>4</sub>	methane
CNG	compressed natural gas
CNR	California Natural Resources Agency
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
County	County of Napa
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
EV	electric vehicle
FEMA	Federal Emergency Management Agency
F-gases	fluorinated gases
FTE	full-time equivalent
GHG	greenhouse gas
GWP	global warming potential

HCFC	hydrochlorofluorocarbons
HFC	hydrofluorocarbon
HVAC	heating, ventilation, and air conditioning
IPCC	Intergovernmental Panel on Climate Change
m	meters
MCE	Marin Clean Energy
MPO	Metropolitan Planning Organization
MT	metric ton
MTC	Metropolitan Transportation Commission
MTCO <sub>2e</sub>	metric tons of carbon dioxide equivalent
N <sub>2</sub> O	nitrous oxide
NVTA	Napa Valley Transportation Authority
NVWT	Napa Valley Wine Train
O <sub>3</sub>	ozone
PACE	property assessed clean energy
PFC	perfluorocarbon
PG&E	Pacific Gas and Electric
PM <sub>2.5</sub>	fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less
ppm	parts per million
RCD	Resource Conservation District
RMP	Refrigerant Management Program
SB	Senate Bill
SCS	Sustainable Communities Strategy
SF <sub>6</sub>	sulfur hexafluoride
SLCP	short-lived climate pollutant
TOD	transit-oriented development
UVA	Upper Valley Waste Management Agency
VMT	vehicle miles traveled
ZNE	zero net energy



Napa County Climate Action Plan



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# Executive Summary





# Executive Summary

This Climate Action Plan (CAP) provides a comprehensive roadmap to address the challenges of climate change in unincorporated Napa County. Acting on climate change means reducing greenhouse gas (GHG) emissions from local sources and helping the community to adapt to climate change and improve its resilience over the long term.

The scientific consensus is that it is “extremely likely” that global climate change is caused by GHG emissions associated with human activities, and that significant reductions in human-caused GHG emissions are needed by the mid-21<sup>st</sup> century to prevent the most catastrophic effects of climate change. To this end, in 2006, the California Global Warnings Solutions Act (Assembly Bill [AB] 32) established the State’s first target to reduce GHG emissions, which established a goal of lowering emissions to 1990 levels by 2020. California has been making steady progress and is expected to achieve the 2020 target; however, ongoing reductions in GHG emissions are needed as noted above.

In 2016, Senate Bill (SB) 32 was signed into law, which established a new mid-term target of 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 29-nation European Union which adopted the same target in October 2014. The new 2030 target places California on a trajectory towards meeting its longer-term goal, which is to bring emissions down to 80 percent below 1990 levels by 2050.

Over the last decade, the County of Napa (County) has taken several steps to begin addressing climate change and achieving reductions in GHG emissions, in the County’s operations as well as the broader community. Since 2007, the County has been involved in various efforts to quantify GHG emissions sources and formulate reduction strategies on both a county and larger regional level. The County’s General Plan and Environmental Impact Report (EIR) called for development and adoption of a CAP. This CAP builds upon the County’s past efforts and fulfills the requirements of the County’s General Plan and EIR.

The key components of the climate action planning process represented in this CAP are briefly summarized below:

1. **A baseline GHG emissions inventory** was prepared for 2014 and is addressed in more detail in Chapter 2 and Appendix A. The key findings from the inventory include:
  - 484,283 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) were emitted by communitywide sources in the unincorporated County in 2014.

The CAP aims to address climate change by reducing GHG emissions from sources within the unincorporated area, and by identifying strategies for adapting to future environmental conditions caused by climate change.

As directed by AB 32 and SB 32, the State aims to reduce annual GHG emissions to:

- 1990 levels by 2020,
- 40 percent below 1990 levels by 2030.

The State’s longer-term goal is to reduce emissions down to 80 percent below 1990 levels by 2050.



Source: County of Napa

The Top 5 Emitting Sectors in 2014:

1. Building Energy Use (31%)
2. On-Road Vehicles (26%)
3. Solid Waste (17%)
4. Agriculture (10%)
5. Off-Road Vehicles (9%).



Source: County of Napa

Local governments play an important role in achieving the State's GHG targets for 2020 and 2030, and in making substantial progress on the pathway to longer-term goals established for 2050. Action and collaboration are needed at all levels to complement and support State level actions.

The CAP contains a total of 49 local GHG reduction measures. While many of the emission reductions of the measures can be quantified, others are more difficult to quantify. However, the combination of all measures contributes towards achieving 2020 and 2030 targets.

- The largest source of emissions was the Building Energy sector (i.e., residential and commercial/industrial buildings and other facilities), which accounted for 31 percent of the inventory; while the Transportation sector accounted for approximately 26 percent of the inventory.

**2. GHG emissions forecasts and reduction targets** and goals were identified for 2020, 2030, and 2050, consistent with State targets under AB 32 and SB 32.

- Without any future actions (i.e., “business-as-usual” conditions), GHG emissions are expected to increase by 2020, 2030, and 2050.
- GHG emissions reduction targets for the CAP were established for 2020 and 2030, along with a long-term goal for 2050, consistent with the most recent guidance provided by the California Air Resources Board (CARB):
  - 2 percent below 2014 levels by 2020;
  - 40 percent below 2014 levels by 2030; and
  - 77 percent below 2014 levels by 2050.
- Legislative actions by State or Federal agencies help to reduce emissions in the future, but are not enough to achieve the 2030 targets. Achieving the 2030 target will require local action to help close the gap between legislative-adjusted emissions forecasts and the emissions limits established by the CAP’s targets.
- The CAP is focused on meeting the 2020 and 2030 targets, which are specific planning targets that will put the County on a long-term downward trajectory towards meeting the long-term 2050 goal.

**3. Local GHG emissions reduction strategies and measures** were identified to help the County achieve the 2020 and 2030 targets.

- GHG reduction strategies in the CAP are aligned with each of the eight GHG inventory sectors and contain a total of 49 specific local reduction measures.
- The primary GHG reduction measures identified in the CAP will result in measurable, quantifiable reductions in emissions. Supporting measures are qualitative measures that are difficult to quantify, but will still contribute to achieving local GHG reductions, either alone or in combination with legislative actions or other local GHG reduction measures.
- The top five measures in the CAP that will the achieve the most local GHG emissions reductions by the year 2030 include:
  - Measure BE-4: Requiring new or replacement residential water heating systems to be electrically-powered or alternatively-fueled (e.g., solar thermal, ground-source heat

pump) will reduce emissions annually by 11,575 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>) by 2030.

- Measure AG-2: Replacing diesel or gasoline-powered agricultural equipment with electric or alternatively-fueled equipment will reduce emissions annually by 8,540 MTCO<sub>2e</sub> by 2030.
- Measure OR-2: Replacing diesel or gasoline with alternative fuels in recreational watercraft throughout the County will reduce emissions annually by 7,512 MTCO<sub>2e</sub> by 2030.
- Measure LU-1: Establishing targets and enhanced programs that result in the preservation of oak woodlands and coniferous forests to avoid future carbon storage and sequestration losses, along with mandatory replanting to mitigate for tree loss when land use changes occur, will result in the annual reduction of 4,544 MTCO<sub>2e</sub> by 2030.
- Measure TR-1: Updating and enforcing the County's Transportation System Management Ordinance will result in an annual reduction of 3,582 MTCO<sub>2e</sub> by 2030.

- While the measures included in the CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic "co-benefits," including climate adaptation co-benefits, that will help to increase community resilience and improve public health.

4. A **climate change vulnerability assessment** was prepared, and climate adaptation measures were developed to improve community sustainability.

- The climate change vulnerability assessment (Appendix C) determined that the County is vulnerable to several adverse impact climate change effects, including:
  - Increases in average temperatures and the frequency of heat waves and extreme heat events;
  - Changes to precipitation patterns;
  - Increased risk of wildfire;
  - Increased likelihood of flooding; and
  - Increased risk of coastal flooding from sea-level rise.
- Specific adaptation measures are included in Chapter 4 to address these effects. Many of the measures require the County and other partnering agencies to address climate-related risks as part of existing planning processes, as well as move towards incremental changes in the way that County services and infrastructure are maintained and operated. Community education and awareness-building are also important components of the adaptation strategies.

The total estimated annual GHG emissions reductions from all reduction measures quantified is approximately 58,327 MTCO<sub>2e</sub> in 2030.

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

A vulnerability assessment includes identification of localized climate change exposure and related effects, an assessment of potential areas of vulnerability, a review of the County's current capacity to adapt to climate-related impacts, and consideration of how likely and how quickly impacts will occur. See Appendix C for the full vulnerability assessment.

The CAP outlines how County staff will implement measures, and how the CAP will be monitored and updated over time to ensure measures and targets are achieved.

**5. Implementation and monitoring mechanisms** are identified that will help the County ensure that the measures and targets are achieved.

- Implementation of the measures in the CAP will require the County to develop and implement new ordinances, programs and projects, or modify existing ones. This will require careful consideration of the operational and capital resources needed, as well as the timing and phasing of implementation. Chapter 5 outlines these assumptions in detail.
- Monitoring is an important aspect of the CAP to ensure that the County is on track to achieve the GHG reduction targets and desired outcomes for increasing resilience in the face of a changing climate. To this end, the County will need to review and update the GHG emissions inventory periodically (every five years), track the community's progress on the implementation status of each measure in the CAP, and report back to the Board of Supervisors and the public at least every two years.
- The County will use the CAP to streamline the analysis of project-level GHG emissions pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15183.5. Projects subject to discretionary review will be required to determine consistency with the CAP Consistency Checklist (see Appendix D).
- Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the County, and other agencies and organizations in the region. On a community-wide level, individuals and businesses can play an important role in combating climate change. By changing habits to consume less energy; produce less waste through recycling, conserve water, and compost; and drive less by choosing to carpool, take transit, or walk and bike more frequently, individuals and businesses can work towards reducing their carbon footprint. The combination of these small efforts can lead to better outcomes for the environment and the County.

The County's CAP monitoring and reporting activities will include:

- Evaluate the performance of CAP measures and prepare a progress report to the Board of Supervisors every two years, and
- Review and update the GHG emissions inventory every five years.

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



Napa County Climate Action Plan



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## Chapter 1

# Introduction

*([https://upload.wikimedia.org/wikipedia/commons/e/e2/Bay\\_Trail\\_in\\_Napa\\_County.jpg](https://upload.wikimedia.org/wikipedia/commons/e/e2/Bay_Trail_in_Napa_County.jpg))  
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## 1.1 Climate Action Plan Overview

There is strong consensus that global climate change is occurring; seasons are shifting, average temperatures are increasing, precipitation levels are changing, and sea levels are rising. These changes will have adverse effects on human health and safety, economic prosperity, provision of basic services, and the availability of natural resources in Napa County.

This Climate Action Plan (CAP) sets a course of action for the County of Napa (County) to address global climate change. The CAP, consistent with and complimentary to statewide legislation and actions, provides a feasible roadmap for the County to both reduce greenhouse gas (GHG) emissions from many sources in the unincorporated County and address the challenges of a changing climate by helping to adapt and respond to climate change over the long term.

While the CAP uses the best information, research, and techniques available today, technologies and markets are constantly changing. Thus, strategies identified in the CAP may become obsolete considering the development of new technologies that do not yet exist, or as new State and Federal laws are passed. However, the overarching goals of the CAP remain the same: to reduce GHG emissions and prepare for and adapt to climate change.

The CAP provides the County with a roadmap to address two climate change challenges: to reduce GHG emissions from sources within the County and to improve its response to climate change over the long term.

The County will monitor, review, and update the CAP to ensure continued effectiveness and relevance of the document.

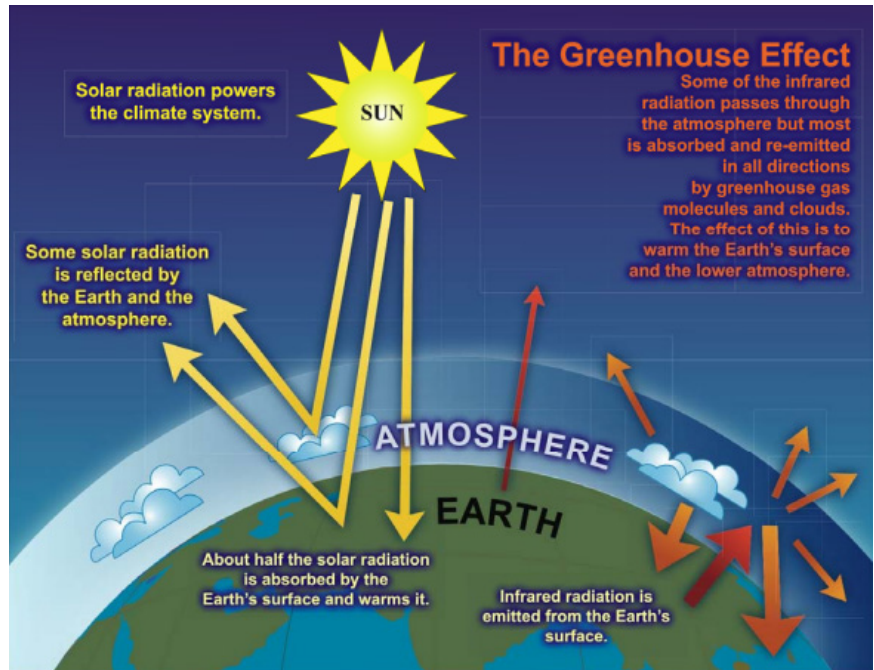
## 1.2 Introduction to Climate Change Science

The greenhouse effect, as outlined below in Figure 1-1, results from a collection of atmospheric gases called GHGs that insulate the Earth and help regulate its temperature. These naturally occurring gases, mainly water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone (O<sub>3</sub>), all act as effective global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth stable. Without the greenhouse effect, Earth would not be able to support life as we know it.



Source: County of Napa





Source: IPCC 2007

**Figure 1-1: The Greenhouse Effect**

However, human activities (e.g., burning of fossil fuels for transportation and energy, and increasing rates of deforestation and development) have contributed to the elevated concentration of these gases in the atmosphere. Human-caused (i.e., anthropogenic) emissions of GHGs above natural ambient concentrations are responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change, or global warming. There is strong scientific consensus that it is "extremely likely" that most of the changes in the world's climate during the last 50 years are a result of anthropogenic GHG emissions (Intergovernmental Panel on Climate Change [IPCC] 2014:3, 5).

Furthermore, short-lived climate pollutants (SLCPs), which are GHGs that remain in the atmosphere for a much shorter period than long-lived climate pollutants (i.e., CO<sub>2</sub> and N<sub>2</sub>O), are powerful climate forcers that have an outsized impact on climate change in the near term. Despite their relatively shorter atmospheric lifespan, their relative potency in terms of how they heat the atmosphere (i.e., global warming potential [GWP]) can be tens, hundreds, or even thousands of times greater than that of CO<sub>2</sub>. SLCPs include CH<sub>4</sub>; F-gases, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>); and, black carbon.

It is "extremely likely" that in the last 50 years, most of the changes in the world's climate are a result of anthropogenic, or human-generated, activities.

Global climate change, is causing changes in precipitation patterns, shrinking polar ice caps, rises in sea level, and other impacts to biological resources and humans. Chapter 2 of the CAP summarizes the County's GHG emissions that are contributing to global warming.

Climate change is a global problem and can lead to significant fluctuations in regional climates. While there is consensus that global climate change is occurring, and is influenced by human activity, there is less certainty as to the timing, severity, and consequences of climate change phenomena, particularly at specific locations. Chapter 4 of the CAP discusses the predicted climate change effects in the County in more detail, while also outlining specific vulnerabilities the County faces because of these effects.

The CAP represents an important step in acknowledging global climate change effects on the County. Chapters 3, 4 and 5 of the CAP includes strategies, specific measures, and implementation programs and monitoring tools to reduce GHG emissions and plan for climate change impacts.

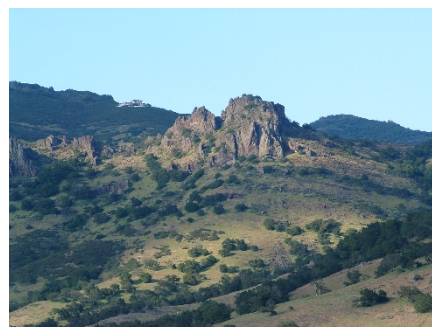
## 1.3 Regulatory Background

In response to the threat of global climate change, the State and County have already taken several steps to both reduce GHG emissions and adapt to climate change. These efforts, briefly summarized below, provide important policy direction and context for the CAP.

### 1.3.1 California

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

On April 20, 2015 Governor Edmund G. Brown Jr. signed Executive Order B-30-15, establishing a new GHG emissions reduction target 40 percent below 1990 levels by 2030. This target aligns with those of leading international governments such as the 29-nation European Union which adopted the same target in October 2014. Executive Order B-30-15 also directed CARB to update the Scoping Plan to identify pathways to achieving the 2030 target. In September 2016, Governor Brown also signed Senate Bill (SB) 32, which codified into



Source: County of Napa

As directed by AB 32, SB 32 and Executive Orders B-30-15 and S-3-05, the State aims to reduce annual GHG emissions to:

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

statute the mid-term 2030 target established by Executive Order B-30-15. The 2017 Scoping Plan, adopted by CARB in December 2017, lays out the framework for achieving the mandate of SB 32 to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030. The new 2030 GHG emissions reduction target places California on a trajectory towards meeting the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050.

Specific to SLCPs, SB 605, which was signed in September 2014, required CARB to develop a plan to reduce emissions of SLCPs. SB 1383, signed in September 2016, requires CARB to approve and begin implementing the plan by January 1, 2018. SB 1383 also sets targets for statewide reductions in SLCP emissions of 40 percent below 2013 levels by 2030 for methane and F-gases and 50 percent below 2013 levels for 2030 for anthropogenic black carbon. CARB adopted the SLCP Reduction Strategy in March 2017 pursuant to SB 605 and SB 1383, laying out options to accelerate SLCP emissions reductions in California through enacting regulations, creating incentives, and other market-supporting activities. SB 1383 also establishes statewide targets to reduce statewide disposal of organic waste by 50 percent below 2014 levels by the year 2020, and a 75 percent reduction below 2014 levels by 2025. Pursuant to the authority granted in SB 1383, the California Department of Resources Recycling and Recovery (CalRecycle) will develop and adopt new statewide regulations by 2019 to achieve the organic waste disposal reduction targets.

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

To effectively address the challenges that a changing climate will bring, the State also prepared the 2009 California Climate Adaptation Strategy, which highlights climate risks and outlines possible solutions that can be implemented throughout the State. This Strategy was updated in 2014 and is now known as Safeguarding California. In 2015, the State developed the Safeguarding California Implementation Action Plans. The Safeguarding California Plan: 2018 Update was released in January 2018. The plan provides an updated programmatic survey of existing efforts to combat climate change throughout the State.

## 1.3.2 Napa County

Over the last decade, the County has taken several steps to begin addressing climate change, sustainability, and reductions in GHG emissions. Since 2007, the County has been involved in various efforts to quantify GHG emissions sources and formulate reduction strategies on both a county and larger regional level. This CAP builds upon these past efforts by creating a GHG inventory for 2014 and forecasting emissions for 2020, 2030, and 2050 to comply with new legislation. Other notable County efforts are highlighted below.

- GHG Reduction Plan for County Municipal Operations:** In 2007, the Napa County Department of Public Works, together with Kenwood Energy, performed a separate inventory and prepared a reduction plan for the GHG emissions associated with the County's municipal operations. The Emissions Reduction Plan identified a suite of actions that would result in reducing emissions from government operations by 15 percent by 2020 compared to 2008 levels (Napa County 2007). In 2016, the County updated the 2008 GHG emissions inventory for County operations (Napa County 2016). A 10 percent reduction has been achieved so far.
- Napa County General Plan (2008):** The County General Plan provides the foundation upon which all future land use and public investment decisions are based. It is a guide for the development of all planning documents, including this CAP, which must be consistent with General Plan Policies. The General Plan includes policies aimed at reducing local contributions to global climate change and encouraging sustainable building practices, sustainable vineyard practices, and ecological stewardship. The General Plan's Environmental Impact Report (EIR) specifically directed the County to develop a CAP as an implementation action and mitigation measure to reduce GHG emissions in the County and address climate change impacts (Mitigation Measure M-4.8.7a).



Source: County of Napa

The CAP is not a part of the General Plan, but must be maintained consistent with the General Plan. This allows the County to update the CAP on an ongoing, as-needed basis, without amending the General Plan. It also ensures that County climate action efforts can be adjusted over time to reflect new legislation and technologies.

## 1.4 Climate Action Plan Purpose and Objectives

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

The GHG reduction targets for the County in the CAP have been established in accordance with CARB's 2017 Scoping Plan recommendations for developing community-wide, plan-level reduction targets. Consistent with the Scoping Plan targets and the State's 2014 GHG emissions inventory, the CAP aims to achieve the

AB 32, SB 32, and Executive Orders B-30-15 and S-3-05 use 1990 levels as a benchmark to identify statewide reduction targets and long-term goals. Because the County's 1990 emissions level were not estimated, proportional targets for the County's CAP were developed for 2014 that are consistent with CARB's 2017 Scoping Plan and the State's 2014 GHG emissions inventory.

following local community-wide GHG reduction targets for 2020 and 2030, and a longer-term goal for 2050:

- 2 percent below 2014 levels by 2020;
- 40 percent below 2014 levels by 2030; and
- 77 percent below 2014 levels by 2050.



Source: County of Napa

To achieve these objectives, the CAP identifies the following:

- A summary of baseline GHG emissions and the potential growth of these emissions over time;
- The expected climate change effects on the County, including areas of vulnerability;
- GHG emissions reduction targets and goals to reduce the community's contribution to global warming; and
- Identification and evaluation of strategies and specific primary and secondary measures to comply with statewide GHG reduction targets and goals, along with measures to help the community adapt to climate change impacts.

As part of CAP implementation, each strategy and measure must be continually assessed and monitored. Reporting on the status of implementation of strategies, conducting periodic updates to the GHG emissions inventory, and performing other monitoring activities will help to ensure that the CAP is making progress towards established goals. See Chapter 5 for more information on administering, implementing, and monitoring the CAP.

## 1.5 Co-Benefits

**Co-benefits are the collateral positive side effects that result from strategies and measures identified in the CAP.**

While the measures included in the CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic “co-benefits.” Environmental co-benefits include improved air quality, water supplies, biological resources, public health outcomes, and beneficial outcomes for other resources. For example, a significant co-benefit of implementing GHG measures related to reductions in motor vehicle use and associated fuel combustion will result in fewer toxic air contaminants, leading to better air quality and improved health for everyone. Other strategies focus on improving energy and water-use efficiency in new and existing buildings, which often contribute to reducing overall housing and operational costs for residents and businesses. Another key GHG reduction measure focuses on improving the sustainability of wineries in the County, which is a large economic driver. By incentivizing wineries in the County to participate in the Napa Green Program, wineries could expand their facilities while also reducing the amount of GHGs their facilities emit.

Furthermore, several reduction measures encourage transit-oriented development and siting of affordable housing in the County, which

allow residents to live closer to jobs, schools, and services, as well as help to reduce housing costs. The CAP also supports the development of increased interregional transit solutions, as well as the construction of more park and ride facilities. Other transportation measures including encouraging the use of active modes of transportation, which can have public health benefits and allow people to drive less, save money, and use their time more constructively.

More detailed discussion of reduction measures, along with their co-benefits, can be found in Chapter 3, Greenhouse Gas Emissions Reduction Strategies and Measures. Further details on the co-benefits analysis can be found in Appendix B. Adaptation co-benefits can be found in Chapter 4, Climate Change Vulnerability and Adaptation.

## 1.6 Community Action and Public Involvement

### 1.6.1 Community Action

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

Effective and long term climate action and resiliency in the County can only be achieved through efforts that continue to change the way individuals interact with the environment. The CAP serves as a resource and starting point to support long term sustainability efforts.

### 1.6.2 Summary of Public Involvement

The CAP was prepared with the involvement and engagement of key internal and external stakeholder groups from various public, private, and nonprofit sectors; as well as individual citizens and residents of the County. The County has held several outreach meetings and public hearings at key milestones in the process to engage the community and interested stakeholders.

The first meeting, which occurred in November 2015, introduced the CAP process, provided a history of County actions to date on climate change, and provided an explanation of methods used in GHG

#### Co-Benefits identified in the CAP:

- Improved Air Quality
- Reduction in Black Carbon Emissions
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Improved Quality of Life
- Reduced Fossil Fuel Reliance
- Protection of Structures and Assets
- Increased Public Awareness of Climate Change
- Reduced Energy Demand
- Reduced Building and Operating Costs
- Reduced Energy, Water, and Sewer Bills

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



Source: County of Napa

emissions inventories. The second meeting took place in February 2016 and presented the results of both the draft GHG emissions inventory and emissions forecasts for the County. There was also time allotted for public comments and questions. The third meeting, occurring in June 2016, presented the draft emissions reductions targets, measures, and gap analysis. At a fourth meeting, held in February 2017, staff presented the Draft CAP to the public and the County Watershed Information and Conservation Council. Public comments on the Draft CAP were accepted from January 26, 2017 through March 10, 2017.

The Planning Commission held a public hearing on the Final CAP on July 5, 2017. The Planning Commission received public comments at this hearing and provided comments and questions to staff, but the Commission did not take action in forwarding a recommendation for adoption to the Board of Supervisors.

In response to public comments received in 2017, the County has since prepared a Revised Draft CAP that will be circulated for public review in the Summer of 2018. Public comments will be accepted on the Revised Draft CAP and the Planning Commission will hold a public hearing on the plan during the comment period. The County is also preparing an EIR for the CAP pursuant to the California Environmental Quality Act (CEQA). The EIR will be released for public review following the public review period for the Revised Draft CAP.

The Final Revised CAP will be brought forth to the Planning Commission for a public hearing and they will be requested to forward a recommendation to adopt the plan to the Board of Supervisors. The Final Revised CAP proposed for adoption will be considered by the County Board of Supervisors at a public hearing.



Napa County Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

## Chapter 2

# Greenhouse Gas Emissions Inventory, Forecasts, and Reduction Targets



*([https://upload.wikimedia.org/wikipedia/commons/4/48/Rolling\\_hills\\_of\\_the\\_Napa\\_valley.jpg](https://upload.wikimedia.org/wikipedia/commons/4/48/Rolling_hills_of_the_Napa_valley.jpg))*By *nigelpopper* (*Rolling hills of the Napa valley*) [CC BY 2.0 (<http://creativecommons.org/licenses/by/2.0/>)],  
via *Wikimedia Commons*

## 2.1 Introduction

This chapter summarizes the community's contribution to global warming by offering a detailed accounting of greenhouse gas (GHG) emissions within the unincorporated areas of Napa County. It includes a discussion of the primary sources and annual levels of GHG emissions for 2014 (i.e., inventory); describes likely trends if emissions are not reduced for 2020, 2030, and 2050 (i.e., forecasts); and sets a path forward to reduce emissions for specific target years (i.e., 2020, 2030), in view of a longer-term reduction goal for 2050. Emissions from communitywide activities are discussed in Sections 2.2 through 2.4.

### 2.1.1 Why Prepare a Greenhouse Gas Emissions Inventory?

Recent increases in global temperatures are highly correlated with elevated GHG emissions resulting from human activities. Per the scientific community, to avoid “dangerous climate change” in the Earth’s climate system, GHG emissions will need to be stabilized so that global temperatures do not increase more than 3.6 degrees Fahrenheit (°F) (2 degrees Celsius [°C]) above pre-industrial levels. To achieve this outcome, global carbon dioxide (CO<sub>2</sub>) emissions must be stabilized between 300 and 350 parts per million (ppm).

One of the main objectives of this climate action plan (CAP) is to identify and reduce local contributions to global GHG emissions. This chapter is intended to serve as a foundation for the strategies and measures that will implement the commitment of the County of Napa (County) to reducing GHG emissions. Measuring GHG emissions is a critical first step in developing the CAP for several reasons. First, the GHG inventory identifies major sources and quantities of GHG emissions associated with the activities and choices currently made by residents, businesses, and public institutions. Second, the inventory provides the baseline that is used to forecast emissions trends and to develop an accurate near-term reduction target and interim goals consistent with State objectives. Finally, the inventory sets the baseline for the County to develop, evaluate, and implement strategies and measures to achieve its near-term target and interim goals.

The GHG emissions inventory also plays a role in ensuring that the County stays on course to meet the GHG reduction targets. After the CAP is adopted, the County will prepare regular GHG emissions inventories that will be compared to the baseline inventory and be used to track progress in reducing emissions as the CAP is implemented.

The inventory establishes 2014 as the baseline year from which the County determines GHG reduction targets.



Source: County of Napa

#### The inventory baseline is used to:

- forecast emissions,
- develop reduction targets, and
- develop, evaluate, and implement strategies to achieve the targets.

Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Orders B-30-15 and S-3-05 use 1990 levels as a benchmark to identify statewide reduction targets. Because the County's 1990 emissions level was not estimated, proportional targets for the County's CAP were developed for 2014 that are consistent with guidance provided by CARB in the 2017 Scoping Plan and the State's 2014 GHG emissions inventory.

## 2.1.2 Overview of GHG Emissions Inventory Characteristics

The emissions inventory is limited to gases that are generated locally in the County or within the region from a defined set of sources (e.g., transportation, electricity use, waste) that can be readily monitored and reduced through County actions.

A local community GHG emissions inventory is an estimate of a defined set of gases emitted to the atmosphere from local or regional sources that contribute to climate change. The six primary GHG emissions typically included in a community GHG emissions inventory are carbon dioxide (CO<sub>2</sub>); methane (CH<sub>4</sub>); nitrous oxide (N<sub>2</sub>O); and, three types of fluorinated gases (F-gases), including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

The community emissions inventory prepared for this CAP is limited to production- and activity-based emissions that are generated from local and regional activities within the unincorporated County or the surrounding region (i.e., San Francisco Bay Area), from a defined set of sources (e.g., transportation, electricity use, waste). The County's inventory was prepared in accordance with the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (International Council for Local Environmental Initiatives [ICLEI] 2012). According to this Protocol, local governments retain discretion regarding the scope of emissions to be included in a local community emissions inventory. Furthermore, as part of the scoping process for preparing a community emissions inventory, local governments need to consider what GHG accounting reporting framework is appropriate for preparation of their local CAP. Like many other local governments in California, the County prepared an emissions inventory using a framework consistent with the Protocol that accounts for emissions sources over which the County would have "significant influence." These sources primarily include community-wide activities that generate emissions within the boundaries of the unincorporated County; however, in the case of transportation, on-road vehicle trip origins and destinations may be located within the County (as a whole) or the broader region (i.e., the San Francisco Bay Area).

Two common terms used when discussing GHG emissions and climate change are "carbon footprint" and "GHG emission inventories." While related, these concepts are not synonymous.

The emissions inventory does not comprehensively address everyone's "carbon footprint" or attempt to quantify life-cycle or consumption-based emissions on a global scale that could be generated from all economic activities associated with the County (e.g., purchasing imported goods, global goods exports, or air travel to and from the County). Unlike a GHG emissions inventory, a carbon footprint is not limited to a defined geography or to a set of activities and sources over which the County has significant influence. A carbon footprint is based on a life-cycle analysis of GHG emissions that result from numerous activities of residences, businesses or organizations, such as the energy required to grow and ship food; the energy required for various forms of travel or goods movement far



Source: County of Napa

beyond the County's borders (e.g., trains, planes, ships); or the embodied energy to manufacture, market, and dispose of the products we use.

Local community GHG emissions inventories are focused on emissions that occur within the physical boundaries of the local community or its surrounding region and over which local agencies have significant influence. Attempting to account for the global, life-cycle carbon footprint of the community in the context of a GHG emissions inventory for a local CAP could result in double counting emissions that are within the inventories of other jurisdictions in California or elsewhere. Furthermore, the State of California's GHG emissions inventories are not based on global, life-cycle emissions analysis; and, the GHG reduction targets established under Assembly Bill (AB 32) and Senate Bill (SB 32) do not assume that achievement of those targets applies to the State's global carbon footprint. Thus, considering the scoping guidance provided in the U.S. Community Protocol and consistent with the State's emissions inventories and efforts to reduce statewide GHG emissions, the preparation of the 2014 GHG emissions inventory for the County's CAP does not include the calculation of the community's global carbon footprint.

This CAP includes strategies and measures that will help achieve the County's objectives to reduce GHG emissions as documented in the GHG emissions inventory. Many of the measures could also help residents, businesses, and organizations reduce their carbon footprint; however, achieving the targets in the context of the community's broader carbon footprint is beyond the scope of this CAP.

It should be noted that residents, businesses, and organizations make choices daily that produce GHG emissions that may be beyond the influence of the County and the CAP. This does not mean that individual residents or business in the County should feel limited to only those measures identified in this CAP, which are focused primarily on the County's inventoried emissions. Rather, members of the community can still make climate-friendly choices, such as buying locally-grown foods and locally-manufactured products that reduce electricity and energy use, to further reduce the local carbon footprint and further contribute to helping reverse global warming trends on a global scale.

## 2.2 Inventory

The first step in the County's climate action planning process is to understand the sources and amounts of GHG emissions generated from activities within the County.

The County's 2014 inventory of GHG emissions is broken down into the following nine sectors, shown in decreasing order by level of contribution:

On a community-wide level, individuals and businesses can play an important role in combating climate change. By changing habits, residents and businesses can work towards reducing their carbon footprint

### The County's 2014 GHG Emissions Inventory has Nine Sectors:

1. Building Energy Use
2. On-Road Vehicles
3. Solid Waste
4. Agriculture
5. Off-Road Vehicles
6. High GWP Gases
7. Wastewater
8. Land Use Change
9. Imported Water Conveyance

Black carbon emissions associated with diesel exhaust will continue to be reduced through state actions.



Source: County of Napa

- **Building Energy Use:** Building Energy sector emissions include CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions generated as the result of electricity and natural gas consumption in residential, commercial, and industrial buildings and stationary equipment, including water pumps for private wells.
- **On-Road Vehicles:** On-road transportation emissions include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions associated with gasoline, diesel and other fossil fuel consumption from motor vehicles on local and regional roadways.
- **Solid Waste:** Solid Waste sector emissions include waste-in-place CH<sub>4</sub> emissions generated from the decomposition of previously-landfilled waste in existing landfills operating in the County, as well as CH<sub>4</sub> emissions from the decomposition of waste generated by residences and businesses in the County in at landfills in various locations.
- **Agriculture:** Agriculture sector emissions include CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O generated during fuel combustion in farm equipment operations; CH<sub>4</sub> and N<sub>2</sub>O emissions from livestock; and, N<sub>2</sub>O from fertilizer use.
- **Off-Road Vehicles:** Off-road vehicles and equipment generate CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions associated with combustion of gasoline, diesel and other fossil fuels.
- **High global warming potential (GWP) gases:** High GWP gas emissions are generated as the result of the use or leakage of refrigerants, electrical insulators in transmission lines, fumigants, and other materials. Emissions in this sector include F-gases such as HFCs, PFCs, and SF<sub>6</sub>.
- **Wastewater:** Wastewater treatment results in CO<sub>2</sub> emissions associated with the electricity consumed during treatment, as well as fugitive CH<sub>4</sub> emissions resulting from the treatment process for domestic sewage and industrial wastewater. Fugitive CH<sub>4</sub> accounts for most of the emissions in this sector.
- **Land Use Change:** Lost carbon sequestration and storage potential from conversion of natural lands such as oak woodlands, forests, and shrublands to developed uses, such as agriculture or urban development.
- **Imported Water Conveyance:** Water-related emissions include CO<sub>2</sub> associated with energy and fuel used to convey imported water into the unincorporated County for domestic, irrigation, and industrial purposes.

An important aspect of GHGs is the unit of measurement used to inventory and estimate emissions. CO<sub>2</sub> is the most prevalent and recognized GHG; however, there are five other primary GHGs that

must be addressed to meet State-mandated reduction targets, including: CH<sub>4</sub>, N<sub>2</sub>O, SF<sub>6</sub>, HFCs, and PFCs. To simplify discussion and comparison of these emissions collectively, climate action plans use a measurement known as carbon dioxide equivalent (CO<sub>2</sub>e).

CO<sub>2</sub>e measurement translates each GHG to an equivalent volume of CO<sub>2</sub> by weighting it by its relative global warming potential (GWP). For example, per the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment, CH<sub>4</sub> and N<sub>2</sub>O are approximately 25 and 298 times more potent, respectively, than CO<sub>2</sub> in their ability to trap heat in the atmosphere (IPCC 2007). The County's 2014 GHG emissions inventory uses the IPCC's Fourth Assessment Report values to maintain consistency with the latest statewide inventory prepared by the California Air Resources Board (CARB). Converting all six classes of GHG emissions into "carbon dioxide equivalents (CO<sub>2</sub>e)" using GWP values allows us to consider all the gases in comparable terms and makes it easier to communicate how various sources and types of GHG emissions contribute to global warming using a standard unit of measurement. A metric ton of CO<sub>2</sub>e (MTCO<sub>2</sub>e) is the standard unit of measurement of the amount of GHG emissions produced and released into the atmosphere.

Some GHG emissions can also be referred to as "short-lived climate pollutants" (SLCPs) because they remain in the atmosphere for a much shorter period than long-lived climate pollutants and have much higher GWP values than longer-lived climate pollutants. SLCPs include CH<sub>4</sub>, F-gases, and black carbon.

The GHG emissions inventory prepared for this CAP includes the most common and prevalent SLCPs (i.e., CH<sub>4</sub> and F-gases); however, black carbon emissions are not quantified in the inventory. Pursuant to SB 605 and 1383, CARB adopted the SLCP Reduction Strategy in March 2017, which outlines how the State will reduce emissions of SLCPs. CARB notes in the SLCP Reduction Strategy that there are considerable difficulties in developing accurate black carbon estimates at the statewide level because they depend on a variety of factors with high rates of variability and uncertainty (CARB 2017b). Thus, because of this uncertainty and known difficulties in developing reliable methods for black carbon inventories, black carbon emissions are not included in the 2014 emissions inventory. Nevertheless, the State is leading the way in reducing black carbon emissions. The SLCP Strategy states that while mobile sources (primarily from diesel exhaust) and wildfire are the primary statewide sources of black carbon, black carbon emissions from mobile sources have been reduced by 90 percent since the 1960s and the State's air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years. Additionally, wildfires are now the largest statewide source of black carbon, and the State will continue to explore the actions needed to decrease emissions (CARB 2017b).

See Section 1.3 Regulatory Background for a more detailed summary of the legislation pertinent to short-lived climate pollutants (SLCPs).

On a local level, certain measures related to on-road transportation and wildfire, will have a co-benefit of reducing black carbon emissions.

Transportation sector GHG reduction measures contained in this CAP are aimed at reducing fossil fuel combustion, increasing the use of alternative fuel and zero-emissions vehicles, and reducing vehicle miles traveled (VMT). These measures will help to further reduce fine particulate matter (PM<sub>2.5</sub>) from diesel fuel combustion and other sources, which will complement the State's efforts under the SLCP strategy and result in co-benefits of reducing black carbon emissions in the County. Less black carbon would also be emitted into the atmosphere in the County through wildfire-related climate adaptation measures contained in this plan. For a complete list of measures related to on-road transportation and wildfire, see Chapters 3 and 4.

Further details on the methodology for the inventory can be found in Appendix A.

**The Top Five Emitting Sectors in 2014:**

1. **Building Energy Use (31%)**
2. **On-Road Vehicle (26%)**
3. **Solid Waste (17%)**
4. **Agriculture (10%)**
5. **Off-Road Vehicles (9%).**

## 2.2.1 Napa County's 2014 GHG Emissions

In 2014, communitywide activities in the County accounted for 484,283 MTCO<sub>2e</sub>. Most emissions were due to building energy use and on-road vehicle activity. Thirty-one percent of these emissions were due to energy used in buildings for heating, cooling, and powering devices, equipment, and other energy loads. Emissions from gasoline and diesel consumption related to vehicles and trucks on local and regional roads accounted for another 26 percent of the County's emissions in 2014.

**The County's 2014 emissions are equal to the emissions of a car driving 1.4 billion miles, or driving to the moon and back 2,851 times.**

To put the County's emissions into perspective, 484,283 MTCO<sub>2e</sub> is equivalent to combusting 54.5 billion gallons of gasoline, combusting 258,388 tons of coal, or a year's worth of carbon sequestration from 458,424 acres of U.S. forests. Assuming an average car gets about 25 miles to the gallon, the County's 2014 emissions is same as a single car driving 1.4 billion miles, or driving to the moon and back 2,851 times (U.S. Environmental Protection Agency 2016).

Additional detail related to the specific emission sectors, data sources, assumptions, and methodology can be found in Appendix A. Figure 2-1 and Table 2-1 below show the breakdown of Napa County's GHG emissions 2014.

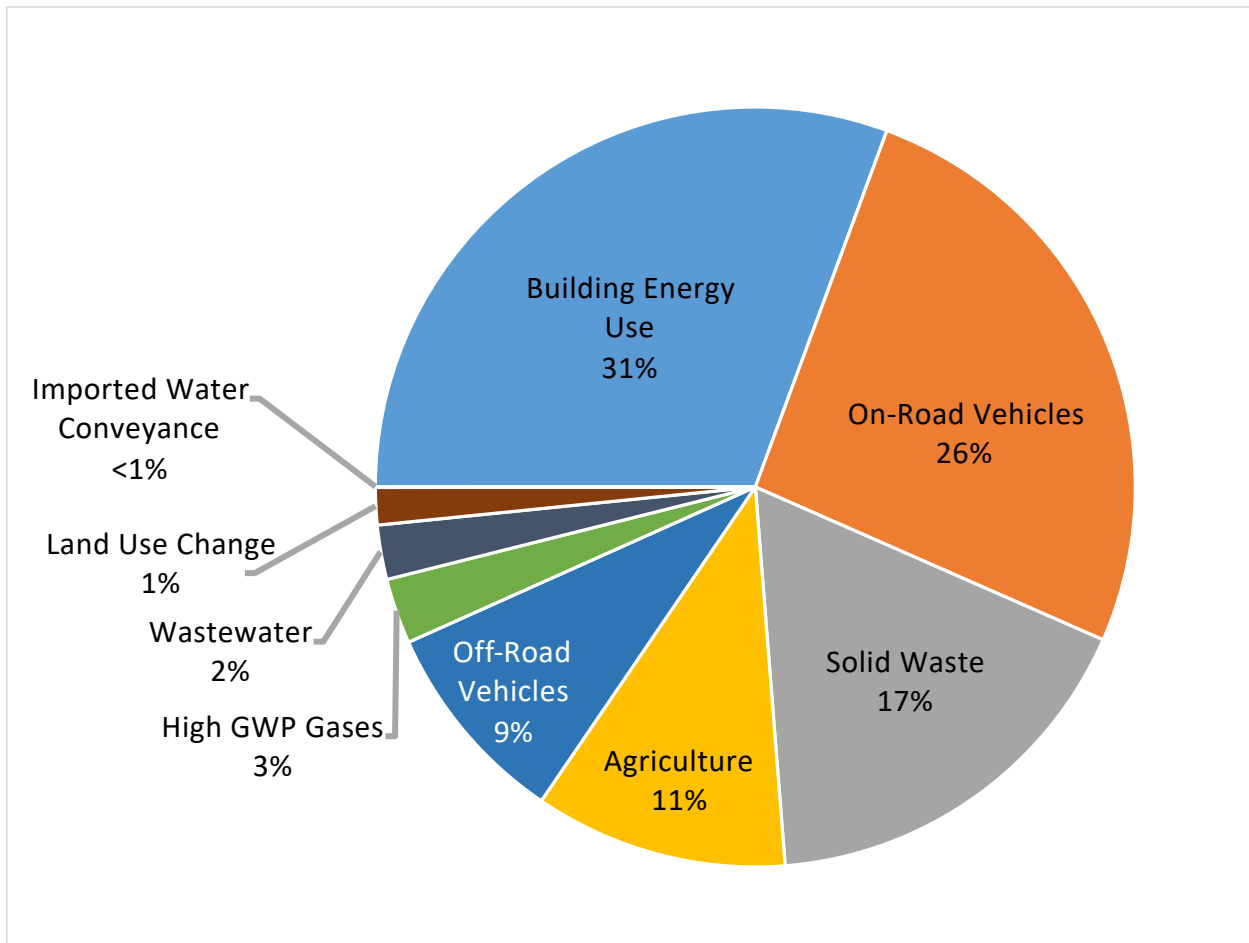


Figure 2-1: Napa County 2014 GHG Emissions

Table 2-1 2014 Unincorporated Napa County Greenhouse Gas Inventory		
Emissions Sector	MTCO <sub>2</sub> e	Percent
Building Energy Use	148,338	31
On-Road Vehicles	125,711	26
Solid Waste	83,086	17
Agriculture	52,198	11
Off-Road Vehicles	42,508	9
High-GWP Gases	13,481	3
Wastewater	11,189	2
Land Use Change	7,684	1
Imported Water Conveyance	88	<1
<b>Total</b>	<b>484,283</b>	<b>100</b>

Source: Ascent Environmental 2016



## 2.3 Forecasts

GHG emissions forecasts provide an estimate of future emission levels based on a continuation of current trends in activity while also accounting for known regulatory actions by State or Federal agencies (i.e., “legislative” actions) that could reduce emissions in the future. Forecasts provide insights into the scale of local reductions needed to achieve the GHG emissions reduction targets, in addition to legislative actions.

The BAU GHG emissions forecasts in the CAP assume a continued increase in population, housing units, employment and vehicle activity. Projections are based on Metropolitan Transportation Commission (MTC) and the Napa County General Plan.

The first step in preparing GHG emissions forecasts is the preparation of a “business-as-usual” (BAU) forecast, which assumes that no additional efforts or legislative actions beyond what have already been adopted will be made to reduce GHG emissions in the future. The BAU forecast also assumes that population, housing, employment, and transportation activity will grow over time, consistent with County projections. Finally, the BAU forecast does not account for GHG emissions reductions associated with implementation of the CAP or legislative actions.

Details on how the forecasts were developed and the indicators used to estimate each sector can be found in Appendix A.

### 2.3.1 Demographic Trends

GHG emission forecasts were estimated for 2020, 2030, and 2050 using County-specific demographic and vehicle activity projections through 2040 from the Metropolitan Transportation Commission (MTC). Based on MTC’s projections, the County’s unincorporated population is expected to increase by 7 percent by 2020, 19 percent by 2030, and 44 percent by 2050 from 2014 levels. Growth in employment is expected at a lower rate than population, with jobs growing by 3 percent by 2020, 8 percent by 2030, and 17 percent by 2050. This is likely because of the continued agricultural character and associated employment characteristics in the unincorporated area.

From 2014 levels, population in the County is expected to increase by:

- 7 percent by 2020,
- 19 percent by 2030, and
- 44 percent by 2050.

The number of households in the unincorporated area is also anticipated to grow by 5 percent by 2020, 12 percent by 2030, and 28 percent by 2050 from 2014, a significantly lower rate than population. Housing growth is anticipated to be concentrated in the cities and towns to accommodate future population increases, highlighting planning efforts to reduce sprawl and achieve denser development.

The forecasts also consider anticipated changes in land use based on Napa County’s General Plan. These land use change forecasts not only affect housing and population, but they also indicate losses in natural vegetation, such as oak woodlands and forests, that sequester CO<sub>2</sub> from the atmosphere.

## 2.3.2 Legislative Reductions

The County's GHG forecasts account for a variety of legislative actions that will reduce future emissions from the County, without any additional local government action called for in this CAP. The applied legislative reductions include:

- improved vehicle fuel efficiency standards;
- a Federal ban on certain high-GWP gases;
- adopted improvements to the State's Building Energy Efficiency Standards;
- adopted statewide targets to reach 33 percent renewable mix in statewide electricity generation by 2020 and 50 percent by 2050;
- a statewide target to double energy efficiency in existing buildings by 2030 (i.e., SB 350);
- a 75 percent statewide waste diversion goal by 2020;
- planned landfill gas capture projects pursuant to State regulations; and
- participation in Marin Clean Energy (MCE).

The legislative reductions described above do not assume that the stringency of GHG emissions reductions will increase beyond 2030. A detailed description and analysis of how specific legislative reductions are included in the County's BAU GHG emissions forecast can be found in Appendix A. Table 2-2 and Figure 2-2 below show the breakdown of the County's forecasted BAU GHG emissions, including a comparison to total annual emissions that will occur without any legislative reductions.



Source: County of Napa

Table 2-2 Unincorporated Napa County BAU GHG Emissions Forecasts: With and Without Reductions (MTCO <sub>2e</sub> /yr)				
Sector and Subsector	2014	2020	2030	2050
Building Energy	148,337	131,643	59,150	67,184
Transportation	125,711	112,854	84,846	85,735
Solid Waste	83,086	62,345	56,711	48,854
Agriculture	52,198	52,521	53,589	57,446
Off-Road Vehicles and Equipment	42,508	45,164	49,592	58,474
High-GWP Gases	13,481	11,828	13,169	15,867
Water and Wastewater	11,277	11,858	12,959	14,335
Land Use Change	7,684	35,608	18,239	21,669
<b>Total BAU with Legislative Reductions</b>	<b>484,283</b>	<b>463,821</b>	<b>348,253</b>	<b>369,563</b>
<i>Percent change from 2014 (%)</i>	<i>0%</i>	<i>-4%</i>	<i>-28%</i>	<i>-24%</i>
Total BAU without Legislative Reductions	484,283	523,645	522,248	557,379
<i>Percent change from 2014 (%)</i>	<i>0%</i>	<i>8%</i>	<i>8%</i>	<i>15%</i>
Reductions due to Current Legislative Actions	0	59,824	173,995	187,816

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

BAU = business as usual

GHG = greenhouse gas emissions

MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalents

Source: Ascent Environmental 2016

### 2.3.3 BAU GHG Forecasts with Legislative Reductions

The legislative actions listed above will help to lower GHG emissions in the unincorporated County, as shown in Table 2-2. Despite a 44 percent increase in population between 2014 and 2050, and without the strategies and measures included in this CAP (see Chapter 3), it is estimated that GHG emissions will decrease by 4 percent from 2014 levels to 463,821 MTCO<sub>2e</sub>/year by 2020. By 2030 and 2050, emissions will decrease by 28 and 24 percent below 2014 levels, respectively.

The overall decrease in emissions is primarily because of substantial increases in renewable electricity generation, improved energy efficiency in existing buildings, and more efficient vehicles. As shown in the legislative-adjusted forecasts in Table 2-2, transportation will replace building energy as the largest emissions sector in the future, accounting for 23 percent of emissions through 2050. On the other hand, emissions from building energy accounted for 31 percent of the County's emissions in 2014, but will account for less than 18 percent of emissions by 2050 in the legislative-adjusted forecasts.

Taking legislative reductions into account, emissions are projected to decrease in the BAU forecast. However, these reductions in emissions are not, in and of themselves, enough to meet State mandates.

## 2.4 Reduction Targets

This CAP primarily focuses on reducing emissions by 2020 and 2030, consistent with State mandates. While setting goals beyond 2030 is important to provide long-term objectives, it is difficult to establish targets beyond a 15-year time frame for which defensible reduction assumptions can be made. This is primarily because of uncertainty around future technological advances and future changes in State and Federal law beyond 2030.

As directed in AB 32, SB 32, and Executive Orders B-30-15 and S-3-05, the State aims to reduce annual statewide GHG emissions to:

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

CARB developed the *First Update to the Climate Change Scoping Plan (Scoping Plan Update)* pursuant to AB 32. It indicated that reducing the State's emissions to 80 percent below 1990 levels by 2050 would be consistent with the IPCC's analysis of the global emissions trajectory needed to stabilize atmospheric concentrations at 350 ppm or less, to reduce the likelihood of catastrophic global climate change (CARB 2014).

To determine an equivalent reduction target at the local level, CARB's 2017 Scoping Plan Update recommends community-wide GHG reduction goals for local climate action plans that will help the State achieve its 2030 target and longer-term 2050 goal (CARB 2017a). These goals consist of reducing emissions to 6 MTCO<sub>2e</sub> per capita and 2 MTCO<sub>2e</sub> per capita by 2030 and 2050, respectively. Considering the overall statewide emissions in 2014 and the estimated statewide population for 2014 through 2050, CARB's recommended per-capita goals are equivalent to reducing 2014 emissions by 40 percent by 2030 and 77 percent by 2050 (CARB 2016, Department of Finance 2014). Thus, consistent with CARB's recommended community-wide targets and recent updates to the State's 2014 GHG emissions inventory, the following adjusted reduction targets should be achieved in the County:

- 2 percent below 2014 levels by 2020;
- 40 percent below 2014 levels by 2030; and
- 77 percent below 2014 levels by 2050.

Attaining a 2 percent reduction in GHG emissions will require that annual emissions be reduced to approximately 474,598 MTCO<sub>2e</sub>/year in 2020, which is about 9,686 MTCO<sub>2e</sub>/year lower than 2014 levels. Forecasts in Table 2-2 show that the County will meet and exceed



Source: County of Napa

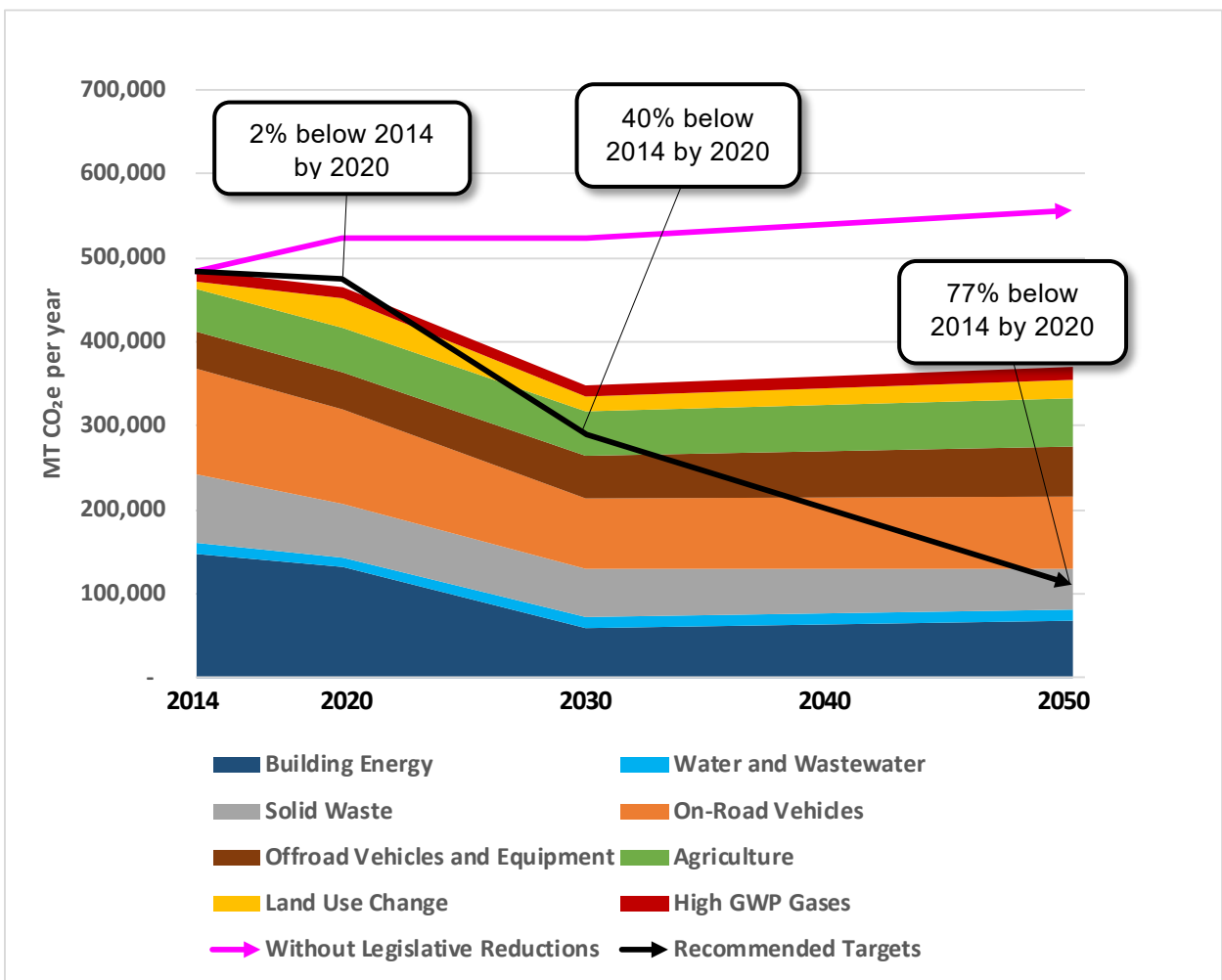
The County's reduction targets are consistent with CARB's 2017 Scoping Plan recommendations for developing community-wide targets and long-term goals, as well as the State's 2014 GHG emissions inventory.

To meet reduction targets, the County will need to reduce emissions to:

- 474,598 MTCO<sub>2e</sub>/year in 2020,
- 290,570 MTCO<sub>2e</sub>/year in 203, and
- 111,385 MTCO<sub>2e</sub>/year in 2050

this reduction target by over 10,000 MTCO<sub>2</sub>e through existing legislative reductions.

To achieve long-term GHG reductions, the County will need to reduce emissions to 290,570 MTCO<sub>2</sub>e/year by 2030, or about 193,713 MTCO<sub>2</sub>e (40 percent) below 2014 GHG emissions levels. To achieve a 77 percent reduction in GHG emissions from 2014 levels by 2050, the County will need to reduce its emissions to about 111,385 MTCO<sub>2</sub>e per year in 2050, which is about 372,898 MTCO<sub>2</sub>e lower than 2014 levels. A detailed technical analysis of the County’s emissions reduction target and goals can be found in Appendix B. Figure 2-2 below shows the GHG reduction targets alongside the breakdown of the County’s emissions over time discounting any actions and measures proposed in this CAP.



Source: Ascent Environmental 2016

**Figure 2-2: Napa County BAU GHG Emissions Forecasts, Targets and Goals without CAP Measures**



Napa County Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

### Chapter 3

# Greenhouse Gas Reduction Strategies and Measures



## 3.1 Introduction

This chapter outlines strategies and specific measures to be implemented by the County of Napa (County) to achieve its greenhouse gas (GHG) reduction targets for 2020 and 2030 and longer-term 2050 goal over the coming decades. The strategies and measures focus on locally-based actions to reduce GHG emissions in various sectors as a complement to legislative actions taken by the State or Federal government.

The strategies mainly focus on community-scale strategies, but also include municipal operations strategies – to address both public and private responsibility for climate change. Through partnerships with and among residents, businesses, and other organizations, these measures will provide net benefits for everyone, such as an improved environment, long-term cost savings, conserved resources, a strengthened economy, and greater quality of life, while also making a difference in the world.

In addition to defining new measures, the Climate Action Plan (CAP) accounts for existing plans, programs, and activities that the County has already undertaken to reduce GHG emissions. The CAP acknowledges these efforts and, in some cases, builds or expands on them.

Many of the strategies and measures to reduce GHG emissions will also have important co-benefits, such as improved air quality, improved water quality, improved conditions for biological resources, and beneficial public health outcomes, which are discussed in this chapter. Further details on the co-benefits analysis can be found in Appendix B. Climate change adaptation and building community resilience are important co-benefits of many GHG reduction measures, and this is discussed in further detail in Chapter 4, Climate Change Vulnerability and Adaptation.

**Co-benefits are the additional beneficial effects that will result from implementation of strategies and measures identified in the CAP, above and beyond the direct benefits of reducing GHG emissions. Co-benefits include improved air quality, water quality, biological resources, and public health outcomes, and beneficial outcomes for other resources.**

## 3.2 Summary of Greenhouse Gas Reduction Strategies

As described in Chapter 2, the County has established a 2020 GHG emissions reduction target (2 percent below 2014 levels), 2030 target (40 percent below 2014 levels), and long-term emissions reduction goal for 2050 (77 percent below 2014 levels) to reduce annual emissions levels, consistent with State laws and guidelines. If communitywide emissions in the county were to continue growing under business-as-usual (BAU) practices and activities, the County's GHG emissions will meet and exceed the 2020 reduction target by just over 10,000 metric tons of carbon dioxide equivalent (MTCO<sub>2e</sub>), but would fall short of the 2030 target by 57,683. With the measures

**The County aims to reduce annual GHG emissions to:**

- 2 percent below 2014 levels by 2020,
- 40 percent below 2014 levels by 2030, and
- 77 percent below 2014 levels by 2050.



included in the CAP and anticipated legislative reductions, the County’s GHG emissions will exceed 2020 and 2030 targets by 57,255 and 644 MTCO<sub>2e</sub> per year, respectively, but would still need to reduce emissions by 156,751 MTCO<sub>2e</sub> per year to meet the longer-term 2050 goal consistent with the State’s long-term goal.

Over time, the County will also monitor, review, and update the CAP with new reduction measures to ensure continued effectiveness and progress towards meeting the long-term 2050 emissions reduction goal.

The quantifiable measures in the CAP currently fall short of meeting the County’s long-term 2050 reduction goal; however, demonstration of achievement of the 2050 goal in a local government CAP is considerably challenging due to the extended time horizon and the County’s limited jurisdiction over numerous sources of emissions. In the coming decades, new innovations and technologies will likely become available that will enable further GHG reductions beyond 2030 on the path to achieving the long-term 2050 goal. New or more reliable methods may also become available to quantify measures that are currently unquantifiable. Finally, new Federal and State laws may further reduce emissions in sectors currently addressed primarily by local County measures. As climate change science and policy continues to advance, the County will be able to apply new reductions toward meeting the long-term 2050 goal in future CAP updates.

Table 3-1 below shows the annual GHG reductions attributable to the measures included in this Plan. Table 3-2 shows how the anticipated reductions will help the County meet its GHG reduction targets and goals. See Appendix B for detailed calculations and an explanation of how the measures in the CAP work towards achieving the 2020 and 2030 targets.

Table 3-1 Annual GHG Reductions by Sector due to Proposed Reduction Strategies and Measures (MTCO <sub>2e</sub> /year)			
Strategy	2020	2030	2050
Building Energy	13,361	16,999	20,412
On-Road Transportation	5,753	4,514	4,745
Solid Waste	1,807	3,731	4,433
Off-Road Vehicles and Equipment	1,687	7,867	23,014
Agriculture	3,512	10,816	22,336
Land Use Change	18,576	8,657	20,751
Wastewater <sup>1</sup>	1,783	5,743	5,737
<b>Total Reductions</b>	<b>46,479</b>	<b>58,327</b>	<b>101,427</b>

Notes: Columns may not add to totals due to rounding.  
<sup>1</sup> Reduction attributed only to Action MS-2, a multi-sector strategy.  
 GHG = greenhouse gas emissions  
 MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalents  
 Source: Ascent Environmental 2018

Emissions Source	2020	2030	2050
Legislative-Adjusted BAU Napa County Emissions	463,821	348,253	369,563
Reductions from CAP Measures	<b>46,479</b>	<b>58,327</b>	<b>101,427</b>
Napa County Emissions with CAP	417,342	289,926	268,136
Napa County GHG Reduction Targets (Percent below 2014)	-2%	-40%	-77%
Maximum Emissions allowed with Targets / Goal	474,598	290,570	111,385
Additional GHG Reductions Needed to meet Targets / Goal	-57,255 <sup>a</sup>	-644 <sup>a</sup>	156,751

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

<sup>a</sup> Negative values represent that the reductions meet and exceed the targets.

BAU = Business-As-Usual

CAP = Climate Action Plan

GHG = greenhouse gas emissions

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents

Source: Ascent Environmental 2018

### 3.3 Strategies and Measures to Reduce Greenhouse Gases

To help close the gap between the County's future BAU emissions and State targets, the CAP includes 49 GHG-reducing measures which are organized under eight GHG emissions sector-based strategies and one multi-sector strategy.

The measures were developed based on a combination of factors, including:

- the feasibility of the measure to be implemented by the County;
- the need for greater reductions in the sectors with the most emissions, especially in building energy and transportation (See Figure 2-1 in Chapter 2);
- existing policies, actions, or programs that can be expanded or proposed policies yet to be adopted;
- feedback from community and other stakeholders; and
- technological innovations.

Under each sector, measures have been further categorized as either **primary measures** or **supporting measures**.

There are 49 GHG reduction measures, organized under eight GHG emissions sector-based strategies and one multi-sector strategy.

Measures are also further organized into two categories: primary measures and supporting measures.

Under the provisions of CEQA Guidelines Section 15183.5, if a project can show consistency with applicable GHG reduction measures in a CAP, the level of analysis for the project required under CEQA with respect to GHG emissions can be streamlined and reduced considerably. See Chapter 5 for more information on how new development projects can show consistency with the CAP.

As part of the CAP implementation process, all GHG reduction measures will be tracked and monitored for effectiveness. If future data and/or quantitation methods become available, supporting measures could be quantified in future updates. See Chapter 5 for more information on implementing and monitoring primary and supporting measures in the CAP.

**Primary measures** are specific programs, policies, and actions that the County will carry out to achieve its climate action strategies. These measures include those for which GHG reductions have been quantified and are the primary measures that the County will rely upon to meet the GHG reduction targets for 2020 and 2030. Many of the primary measures include specific and enforceable components that could be applied to future projects seeking to tier and streamline from the CAP in the future; however, not all primary measures are regulatory in nature. Some of the primary measures that will result in quantifiable GHG reductions do not rely on County regulation or are the responsibility of other local agencies or organizations, either solely or in partnership with the County. All primary GHG reduction measures were quantified wherever substantial evidence and reasonable assumptions were available to support calculations.

**Supporting measures** are qualitative measures that are not identified as part of the primary set of quantifiable GHG reduction measures needed to meet CAP targets. Some supporting measures were not quantified to avoid double-counting of GHG reductions achieved by other primary measures that are similar in nature, while others were not quantified because of a lack of available data and/or lack of methods to quantify emissions reductions. However, over time, implementation of supporting measures may still result in GHG reductions and could be quantified in future CAP updates if data or quantification methods become available. Additionally, supporting measures included in the CAP are still considered important complementary actions to State or other County measures. Finally, supporting measures are also important to include in the CAP because they will achieve other important co-benefits.

Each sector-based strategy is described in detail in this chapter, including a summary of primary measures and associated GHG emissions reductions, and supporting measures under each strategy. Additional technical details for all measures, including supporting calculations for primary measures and the results of the GHG measures analysis (including co-benefits), can be found in Appendix B. Chapter 5 further describes how both primary and supporting measures will be implemented under each strategy.

### 3.3.1 Building Energy

The energy used in buildings is a significant contributor to GHG emissions in the County, accounting for 31 percent of total emissions (10 percent from residential and 21 percent commercial/industrial) in 2014. Although legislative reductions related to State actions will help to reduce building energy emissions by 60 percent from 2014 levels by 2030, and 55 percent by 2050, additional reductions can help the County meet State GHG reduction targets.



Source: County of Napa

The Building Energy strategy offers the greatest opportunity to achieve emissions reductions across the eight strategies. Measures under the Building Energy strategy will reduce building energy emissions by an additional 11 percent, resulting in a 72 percent reduction from 2014 levels by 2030, and a 68 percent reduction by 2050 when combined with legislative reductions. The building energy measures included in the CAP aim to further reduce emissions by improving energy efficiency earlier than or beyond State requirements, streamlining access to renewable energy, and increasing the supply of renewable energy for homes and businesses within the county. The success of these measures relies on coordination with local utilities and organizations, participation from the community, and administration of new or revised local policies and programs. Major co-benefits of building energy measures include improved air quality, reduced reliance on fossil fuels, and monetary savings. Furthermore, California Green Building Standards Code (CALGreen) Tier 1 standards include stipulations regarding low-VOC materials and building ventilation, leading to improved indoor air quality and health outcomes. These benefits are discussed in greater detail in Appendix B.

**Legislative reductions contribute greatly to emission reductions in the Building Energy sector. Beyond legislative reductions, measures under the Building Energy will reduce emissions by an additional:**

- 11 percent in 2030, and
- 14 percent in 2050.

The Building Energy strategy includes 11 measures, seven of which are primary measures and four of which are supporting measures. The primary measures include a new water heater replacement program and formal adoption of new construction standards to help achieve the State's zero net energy (ZNE) goals. Combined, these two measures will reduce emissions by 13,612 MTCO<sub>2e</sub> per year by 2030. The seven primary measures together are expected to reduce emissions by 16,999 MT CO<sub>2e</sub> by 2030.

**All Building Energy measures also serve as adaptation measures by reducing overall energy demand and increasing the ability of the community and local economy to weather future change. For a complete list of adaptation measures, see Chapter 4.**

Table 3-3 summarizes building energy primary and secondary measures. Each measure is described in further detail below.

<b>Table 3-3 Summary of Building Energy Measures</b>				
Measure Number	Measure Description	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Primary Measures</b>				
BE-1	Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for eligible alterations or additions to existing buildings	28	23	24
BE-2	Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for all new construction, and phase in ZNE standards for new construction, beginning with residential in 2020 and non-residential by 2030.	1,361	2,037	4,587
BE-3	Increase participation in MCE's Deep Green (100% renewable) option	4,005	1,384	1,338
BE-4	Require new or replacement water heating systems to be electrically powered or alternatively fueled (e.g., solar water heating) for all residential land uses.	6,096	11,575	12,550
BE-5	Expand current renewable energy and green energy incentives and update local ordinances	1,479	1,806	1,703
BE-6	Select MCE's Deep Green Option for all County Facilities	382	170	205
BE-7	Support Waste-to-Energy Programs at Unincorporated Landfills	10	5	5
<b>Supporting Measures</b>				
BE-8	Work with PG&E, BayREN, MCE, PACE financing programs, and other regional partners to incentivize energy efficiency improvements in existing buildings	NA	NA	NA
BE-9	Require energy audits for major additions to or alterations of existing buildings	NA	NA	NA
BE-10	Develop a program to allow new development to offset project GHG emissions by retrofitting existing income-qualified homes and buildings	NA	NA	NA
BE-11	Encourage Solar Panel Installations on Warehouse Roof Space	NA	NA	NA
TOTAL		13,361	16,999	20,412

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

<sup>1</sup> Emissions reductions quantified under BE-6 only apply to residential water heating systems.

BAU = Business-As-Usual

BayREN = Bay Area Regional Energy Network

CALGreen = California Green Building Standards Code

CAP = Climate Action Plan

GHG = greenhouse gas emissions

MCE = Marin Clean Energy

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalent

NA = Not Available

PACE = property assessed clean energy

ZNE = zero net energy

Source: Ascent Environmental 2018

## Primary Building Energy Measures

### ***Measure BE-1 Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for eligible alterations or additions to existing buildings.***

The County will amend County Code to require compliance with CALGreen Tier 1 standards (Title 24, Part 11), as well as Tier 1 building energy efficiency standards (Title 24, Part 6), for alterations and additions over 1,000 square feet, in addition to requiring energy audits (see Measure BE-9). The County may also consider incentivizing compliance with CALGreen Tier 2 standards for eligible buildings, such as through expedited permitting or reduced permit fees (see Measures BE-5 and BE-8 below). CALGreen Tier 1 also requires all appliances to be EnergyStar rated.

### ***Measure BE-2 Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for all new construction, and phase in ZNE standards for new construction beginning with residential in 2020 and non-residential by 2030.***

The County will amend the County Code to require compliance with CALGreen Tier 1 green building standards (Title 24, Part 11), as well as Tier 1 building energy efficiency standards (Title 24, Part 6), for all new construction. These “reach code” standards include green building measures that can reduce GHG emissions beyond mandatory CALGreen requirements in several categories, including Energy Efficiency, Planning and Design, Water Efficiency and Conservation, Materials Conservation and Resource Efficiency, and Indoor Air Quality. Compliance with these green building measures can lead to increased use of green and recycled materials, turf area limits, reduction of construction waste through recycling, and other important features that achieve important sustainability and public health co-benefits.

Under Tier 1 standards, new construction will be required to exceed minimum building energy efficiency standards by 15 percent or more. The County may also consider additional incentives for new construction projects meeting or exceeding Tier 2 standards which will have energy efficiencies of 30 percent above current standards (see Measures BE-5 and BE-8 below).

The State is considering, but has not formally adopted, a mandatory ZNE<sup>1</sup> standard for all new residential construction starting in 2020 and new commercial construction starting in 2030. Under this measure, the County will also revise the County’s building code to phase in and formally adopt the State’s proposed ZNE standard in 2020. The State has demonstrated that ZNE can be achieved through a combination of

#### Co-Benefits (BE-1 and BE-2)

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance
- Reduced Building and Operating Costs



Source: County of Napa

<sup>1</sup> A ZNE building is one that produces as much renewable energy on-site as it consumes in one year.

high-performance energy efficient design and maximizing on-site renewable energy production (e.g., solar and storage).

To phase in the ZNE requirements, the County will amend the local building code to require compliance with ZNE standards for all residential and commercial construction starting in 2020 and 2030, respectively.

Under this measure, CALGreen Tier 1 measures for green building categories other than energy efficiency (Planning and Design, Water Efficiency, Material Conservation and Resource Efficiency, and Indoor Air Quality) will continue to be required after ZNE requirements have been phased in.

Also, with respect to Water Efficiency and Conservation standards under CALGreen Tier 1, the County will develop a program to provide incentives through the permitting process, including:

- incentivize installation of commercial and residential rainwater capture systems,
- incentivize installation of commercial and residential graywater capture and reuse systems for discharge to irrigation applications, and
- require ultra-low flow fixtures and toilets in new construction.

***Measure BE-3 Increase participation in MCE's Deep Green (100 percent renewable) option***

The County will develop and provide incentives for residents and businesses to adopt Marin Clean Energy's (MCE's) Deep Green Option, which provides 100 percent renewable electricity. The County will consider subsidizing the extra cost of opting into Deep Green (e.g., \$0.01 per kilowatt hour) for low-income households, and will develop incentives for wineries, hotels, and other businesses that opt into Deep Green. The County will also work with MCE to promote awareness of the Deep Green Option.

***Measure BE-4 Require new or replacement residential and commercial water heating systems to be electrically powered and/or alternatively fueled (e.g., solar water heating) for all residential land uses***

As part of a new ordinance or revisions to existing County Code, the County will act to require all new or replacement residential water heaters to be either electrically-powered or alternatively fueled systems, such as solar thermal or geothermal heat pump systems. Replacement of natural gas-fueled water heaters with electric or alternatively fueled heating allows for more opportunities to reduce emissions by displacing on-site fossil fuel combustion with electricity that is at least 50 percent renewable under MCE, on-site renewable energy, or a combination thereof.

<p><b>Co-Benefits (BE-3 and BE-4)</b></p> <ul style="list-style-type: none"><li>▪ Improved Air Quality</li><li>▪ Reduced Fossil Fuel Reliance</li></ul>
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This measure will be enforced through the County's current permitting process and will initially apply to residential properties first. New or replacement residential natural gas water heaters would typically no longer be permitted under this ordinance unless they meet stringent annual fuel efficiency ratings (i.e., 95 or higher). Examples of eligible replacement types could include solar thermal water heaters, tankless on-demand and storage-type electric water heaters, geothermal heat pumps, and electric heat pump systems. Electric water heaters could be paired with a solar water heating system to provide backup hot water. Heat pump systems could also include air or ground-source heat pump systems. The County will later phase in requirements for new or replacement commercial water heaters to develop an effective program that can accommodate the variations in size, cost, and capacity of commercial-grade water heaters.

As part of this measure, the County will also consider offering financial incentives if the conversion to electric would require substantial work beyond the unit replacement cost. Financial incentives would also help to offset the incremental cost of electric or solar thermal systems compared to natural gas water heaters for eligible homeowners. The County could also expedite or reduce permitting fees associated with electric or solar water heating installations; however, no incentives would be provided for natural gas systems. This could be achieved in coordination with implementation of Measures BE-5 and BE-8.

***Measure BE-5 Expand current renewable energy and green energy incentives and update local ordinances***

The County will continue to provide expedited permitting incentives for installing solar panels, electric vehicle charging stations, and wind turbines. The County will also consider expanding incentives to other green technologies (e.g., solar water heating systems, geothermal ground-source heat pumps, micro-turbines, and battery storage). The purpose of the ordinance update would be to ensure that ground-based solar systems would not count against residential acreage limits on agricultural land uses. Any modifications to ordinances under this measure will ensure that ground-based solar panels will not change residential acreage limits on agricultural land uses.

The County will also work with Google, National Renewable Energy Laboratory, or other information providers to help communicate the customized cost-benefits associated with solar opportunities for each resident and business. The County will set a goal of approving 20,000 kW worth of solar permits by 2030, periodically review progress of permit applications, and adjust incentives and outreach efforts accordingly.

***Measure BE-6 Select MCE's Deep Green option for all County facilities***

The County will select MCE's Deep Green option for all County-owned facilities within the County's operational control.

**Co-Benefits (BE-5)**

- Improved Air Quality
- Reduced Fossil Fuel Reliance

**Co-Benefits (BE-6)**

- Improved Air Quality
- Reduced Fossil Fuel Reliance



- Co-Benefits (BE-7)**
- Improved Air Quality
  - Improved Water Supply and Quality
  - Improved Public Health
  - Reduced Fossil Fuel Reliance

**Measure BE-7 Support waste-to-energy programs at unincorporated landfills**

The County will encourage landfills located in the county to pursue waste-to-energy programs that convert waste-based fuel to usable energy that can offset a facility’s non-renewable energy usage.

## Supporting Building Energy Measures

**Measure BE-8 Work with PG&E, BayREN, MCE, PACE financing programs, and other regional partners to incentivize energy efficiency improvements in existing buildings**

The County will provide information on County-, State-, utility-based, and other local or regional energy efficiency programs and funding opportunities (e.g., Pacific Gas and Electric’s [PG&E’s] Energy Watch Program, Bay Area Renewable Energy Network [BayREN], MCE, Sustainable Napa County, and various property assessed clean energy [PACE] financing programs). Information sharing can be done through providing informational brochures at County offices, updating the County website, and other methods.

- Co-Benefits (BE-8 and BE-9)**
- Improved Air Quality
  - Reduced Fossil Fuel Reliance

**Measure BE-9 Require energy audits for major additions to or alterations of existing buildings**

The County will amend the County Code to require energy audits when a building permit application is submitted for a substantial addition to or alteration to an existing building. Audits could be triggered by an alteration or addition greater than or equal to 50 percent of a lot’s total building square footage. Permit applicants would be required to incorporate all cost-effective improvements into the project to increase energy efficiency per the recommendations of the audit.

According to permit records, the County issued or finalized an average of 300 permits per year for additions, alterations, and replacements for inhabited residential and commercial land uses between 2010 and 2015.

This measure could be combined with BE-8 to inform permit applicants of available incentives and financing available to cover efficiency upgrades pursuant to audit recommendations.

**Measure BE-10 Develop a program to allow new development to offset project GHG emissions by retrofitting existing income-qualified homes and buildings**

The County will establish a program that allows new development to offset construction or operational GHG emissions by setting up a funding mechanism into which developments pay and, indirectly, finance residential energy efficiency retrofits in local existing income-qualified homes or buildings. The County will need to determine how the offset funds will be used to fund retrofits. Emissions benefits may be quantifiable once program details are established. The County could consider pairing funds from the retrofit program with other funding

- Co-Benefits (BE-10)**
- Improved Air Quality
  - Improved Water Supply and Quality
  - Improved Public Health
  - Reduced Fossil Fuel Reliance

sources or financing mechanisms to allow for even greater energy efficiency improvements in existing buildings (see Measure BE-8).

**Measure BE-11 Encourage solar panel installations on commercial roof spaces**

The County will work with MCE and commercial & industrial building owners to encourage solar panel installations on roof spaces. The County would develop a program to incentivize these installations by expediting permitting or reducing permit fees associated with installations on existing facilities (see Measure BE-5). The County could also work with interested stakeholders in developing a program to encourage solar panel installations for Feed-in-Tariff arrangements.

**Co-Benefits (BE-11)**

- Reduced Fossil Fuel Reliance
- Reduced Energy Demand
- Reduced Energy, Water, and Sewer bills

### 3.3.2 On-Road Transportation

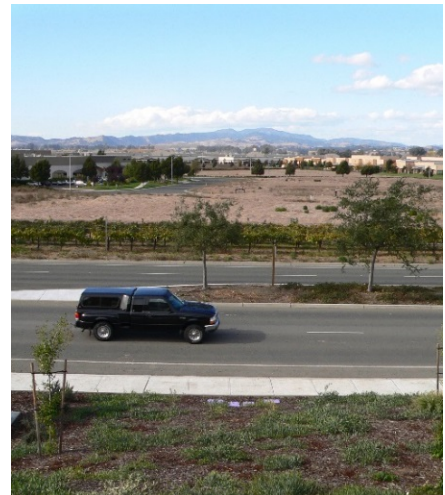
Like building energy, on-road transportation is also a significant contributor to the County's GHG emissions. Emissions from on-road transportation sources accounted for 26 percent of the County's total emissions in 2014. Legislative reductions outside of the County's jurisdiction will reduce 2014 transportation emissions by 33 percent by 2030 and 32 percent by 2050 despite population growth, mainly due to improvements in State and Federal vehicle fuel efficiency standards. These legislative reductions apply to the fuel efficiency of vehicle operations, while measures that affect the frequency or distance of vehicle travel are within local or regional control and can be addressed in a local CAP.

Legislative reductions contribute greatly to emission reductions in the On-Road Transportation sector. When combined with legislative reductions, on-road transportation measures will reduce annual GHG emissions by:

- 36 percent by 2030, and
- 36 percent by 2050.

The Plan's on-road transportation measures together with legislative reductions will reduce 2014 emissions from this sector by 36 percent by 2030 and a 36 percent by 2050. The transportation-related measures proposed under this strategy aim to further reduce emissions by reducing vehicle trips through consolidation of vehicle trips and non-motorized solutions, encouraging the use of electric and alternative fuel vehicles, and reducing vehicle miles traveled (VMT) through smarter land use planning. Emissions reductions from these measures rely on successful coordination with and participation from local and regional transportation and planning agencies, incorporated cities in the county, residents, and businesses. These measures will also help to reduce criteria pollutants such as fine particulate matter (PM<sub>2.5</sub>) from diesel fuel combustion and other sources, which will result in the additional co-benefits of reducing black carbon emissions, improved air quality, and improved public health outcomes. These benefits are discussed in greater detail in Appendix B.

This strategy includes 15 measures, five of which are primary measures and 10 of which are supporting measures. One major measure included in this strategy is an update to the County's transportation system management ordinance that will establish a policy mechanism that reduces commute trips and VMT. Measures under this strategy will also encourage and support the development of active transportation projects in the County.



Source: County of Napa

Table 3-4 summarizes the on-road transportation primary and secondary measures. Each measure is described in further detail below.

<b>Table 3-4 Summary of On-Road Transportation Measures</b>				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2e</sub> /year)		
		2020	2030	2050
<b>Primary Measures</b>				
TR-1	Update Transportation System Management Ordinance (for employers)	4,818	3,582	3,547
TR-2	Adopt parking reduction ordinance revisions	78	58	57
TR-3	Increase affordable housing, especially workforce housing, in Napa County	31	23	23
TR-4	Support efforts to allow commuter service to operate on railroad rights-of-way	542	605	948
TR-5	Support efforts of solid waste collection services to convert diesel solid waste collection vehicles to use CNG	284	247	169
<b>Supporting Measures</b>				
TR-6	Support efforts of transit agencies to increase availability and accessibility of transit information	NA	NA	NA
TR-7	Support alternatives to private vehicle travel for visitors	NA	NA	NA
TR-8	Support Napa County's incorporated cities in developing transit-oriented development unique to the needs of the Napa Region	NA	NA	NA
TR-9	Support interregional transit solutions	NA	NA	NA
TR-10	Work with Napa County's incorporated cities, NVTA, and neighboring regions to increase presence of park and ride facilities near residential centers	NA	NA	NA
TR-11	Promote existing ride-matching services for people living and working in the unincorporated county	NA	NA	NA
TR-12	Increase the supply of electric vehicle charging stations	NA	NA	NA
TR-13	Promote telecommuting at office-based businesses	NA	NA	NA
TR-14	Develop and implement active transportation projects	NA	NA	NA
TR-15	Require new development projects to evaluate and reduce VMT	NA	NA	NA
TOTAL		5,753	4,514	4,745

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

CNG = compressed natural gas

GHG = greenhouse gas emissions

MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalents

NVTA = Napa Valley Transportation Authority

PG&E = Pacific Gas and Electric

NA = Not Available

Source: Ascent Environmental 2018

## Primary On-Road Transportation Measures

### ***Measure TR-1 Update Transportation System Management Ordinance (for employers)***

The County will revise, adopt, and enforce the existing Transportation System Management ordinance. The updated ordinance will include measures to reduce commute trips to workplaces within the county as well as a program to oversee implementation of these measures at businesses. The County may consider a point-based system that allows employers with more than 20 employees to choose the best trip reduction measures that work for them. The County may recommend a list of trip reduction measures, such as preferential parking for carpools/vanpools or providing shuttle service. The ordinance could also establish a measurable target (e.g., percent increased vanpool ridership and number of transit pass sales). See example trip reduction ordinances from the U.S. Environmental Protection Agency and Code 17.94.060 (Transportation Control Measure) for the City of Rocklin (U.S. Environmental Protection Agency 2011). The ordinance will be integrated with current Bay Area Air Quality Management District (BAAQMD) and Metropolitan Transportation Commission (MTC) programs and regulations.

#### **Co-Benefits (TR-1)**

- Improved Air Quality
- Reduction in Black Carbon Emissions
- Improved Public Health
- Reduced Fossil Fuel Reliance

### ***Measure TR-2 Adopt parking reduction ordinance revisions***

The County will develop, adopt, and enforce reductions in visitor and employee parking requirements, and require minimum carpool/vanpool/tour bus or shuttle parking spaces, consistent with CALGreen Tier 1 measures (see CALGreen Tier 1 requirements for applicable projects in Measures BE-1 and BE-2 above). The County will also consider allowing dedicated electric vehicle (EV)-only parking in lieu of parking reductions. Reductions in standard parking requirements will be made to the standards in Napa County Code 18.66.280.

#### **Co-Benefits (TR-2, T-3, and TR-4)**

- Improved Air Quality
- Reduction in Black Carbon Emissions
- Improved Public Health
- Reduced Fossil Fuel Reliance

### ***Measure TR-3 Increase affordable housing, especially workforce housing, in Napa County***

The County will increase affordable housing (including workforce housing) through implementation of policies and programs in the County's Housing Element, and by promoting and encouraging the development of affordable housing and transit-oriented development (TOD) in priority development areas in the County as allowable under the County's jurisdiction. Also, the County will encourage the development of housing closer to jobs and services. The Napa Valley Transportation Authority's (NVTA) Countywide Transportation Plan (Vision 2040) predicts growth in low-wage employment throughout the County. Given the many low-wage jobs already located in the county, VMT from commuting will increase without sufficient affordable housing in the County.



Source: County of Napa

***Measure TR-4 Support efforts to allow commuter service to operate on railroad rights-of-way***

The County will support efforts to allow commuter rail service to operate on railroad rights-of-way in the County, so long as it does not worsen traffic congestion and associated vehicular emissions. The NVTA has already explored the possibility of having such a service, but no action has yet been taken to implement such a service. Enhancing connection services, such as shuttles, between stations and nearby employment destinations, in both incorporated and unincorporated areas, will improve the effectiveness of this measure.

According to the 2014 Napa County Travel Behavior Study Survey, 66 percent of workers in the County live in Napa County cities and could be serviced by the commuter rail service on the Napa Valley Wine Train line (NCTPA 2014:109). Twelve percent of workers in the County work in the unincorporated area. This measure will reduce more trips associated with VMT to and from incorporated cities and the unincorporated county.

**Co-Benefits (TR-5)**

- Improved Air Quality
- Reduction in Black Carbon Emissions

***Measure TR-5 Support efforts of solid waste collection services to convert diesel solid waste collection vehicles to use compressed natural gas***

The County will support and encourage solid waste services to convert diesel and gasoline solid waste collection vehicles to compressed natural gas (CNG) or other alternative fuels, thereby reducing fleet-wide emissions.

## Supporting On-Road Transportation Measures

***Measure TR-6 Support efforts of transit agencies to increase availability and accessibility of transit information***

The County will support efforts to improve overall availability and accessibility of transit information. NVTA is currently working with Google to provide up-to-date transit information online.

**Co-Benefits (TR-6, TR-7, and TR-8)**

- Improved Air Quality
- Reduction in Black Carbon Emissions
- Improved Public Health
- Reduced Fossil Fuel Reliance

***Measure TR-7 Support alternatives to private vehicle travel for visitors***

The County will improve access to available travel alternatives for visitors. The ways the County will support travel alternatives include:

- subsidizing shuttles for visitors;
- offering winery travel trip route plans that reduce trips and VMT;
- providing information of public and private multi-modal options (e.g., bike tour, van tour, motorcycle tour);
- participating in an industry-wide transportation demand management program (such as a “hop-on hop-off” shuttle programs);
- exploring driverless technology solutions, as they become available;

- requiring dedicated parking space for eligible car-sharing vehicles at major destinations;
- providing cost comparisons to tourists to show monetary and safety benefits of driving vs. using a shuttle service; and
- offering additional subsidies for commercial fleets that are more than 50 percent alternatively fueled.

***Measure TR-8 Support Napa County's incorporated cities in developing transit-oriented development unique to the needs of the Napa Region***

The County will work with the City of Napa and other incorporated cities in exploring the possibility of making the recently-built Soscol Gateway Transit Center, other planned transit hubs, and surrounding areas more visitor-friendly and not just serve commuters. Transit facilities can be marketed as attractions in and of themselves. The County will also support and encourage development of restaurants, hotels, and other attractions within walking distance of the transit center throughout the County, as its jurisdiction allows. One example of such a development is a “grand station” district concept with easy and walkable access to major downtown destinations (e.g., downtown Napa, Riverfront green). This will encourage transit and other non-automobile ridership for visitors traveling to and from the county. This measure should be enacted in tandem with vanpool, shuttle, and increasing transit service in the county (e.g., stops along Vine’s Route 10). In addition to funding, the County could install wayfinding signage to promote uses of these developments.

***Measure TR-9 Support interregional transit solutions***

The County will support and work with NVTA, Association of Bay Area Governments (ABAG), MTC, and Bay Area tourism bureaus to develop transit solutions for interregional passenger travel between San Francisco/East Bay and Napa County, including the unincorporated areas. In addition to expanding connections with ferries, Bay Area Rapid Transit, and Amtrak, the County will consider supporting improvements to existing transit/rail connections to Sonoma County via the Sonoma-Marin Area Rail Transit (SMART) system, and with Solano County, to increase ridership. This could help offset employee commuter trips to and from the county. The County will also work with NVTA to implement or support applicable measures for interregional travel already included in NVTA’s Short Range Transit Plan and Vision 2040.

**Co-Benefits (TR-9, TR-10, TR-11 and TR-12)**

- Improved Air Quality
- Reduction in Black Carbon Emissions
- Improved Public Health
- Reduced Fossil Fuel Reliance

***Measure TR-10 Work with Napa County's incorporated cities, NVTA, and neighboring regions to increase presence of park and ride facilities near residential centers***

The County will work with the incorporated cities, neighboring jurisdictions, and NVTA to install additional park and ride facilities near major unincorporated residential centers, where feasible. Currently, there are only a handful of park and ride facilities in the County, all of which are located in three incorporated cities: Yountville, the City of Napa, and American Canyon. The additional

park and ride facilities will help consolidate and reduce vehicle trips through carpooling, vanpooling, and transit.

**Measure TR-11 Promote existing ride-matching services for people living and working in the unincorporated county**

The County will support NVRTA and the Solano Transportation Authority to promote awareness of the ride-matching services provided through the Solano Napa Commuter Information website and other organizations. The County will work with local businesses, especially winery, vineyards, and hospitality, to provide information to employers and their employees on ridesharing or shuttle options to transport seasonal workers to and from home. The County will consider offering monetary and non-monetary incentives.

**Measure TR-12 Increase the supply of electric vehicle charging stations**

The County will promote or incentivize installation of EV charging stations at wineries, industrial centers, hotels, major visitor attractions, and multifamily complexes. Charging stations will also be required at park-and-ride facilities. Stations should have clear and obvious signage, require some form of payment to allow for availability, be near amenities, easily accessible, and enforced. The County will also ensure consistency with plans already made under Vision 2040.

Additionally, as noted in Measures BE-1 and BE-2, new construction projects or major additions or alterations to existing buildings will be required to implement CALGreen Tier 1 measures. Tier 1 measures under the Planning and Design section of the code require a minimum number of on-site, dedicated EV parking spaces and pre-wiring dedicated spaces for EV charging stations. This will also contribute to increasing the supply of EV charging.

**Measure TR-13 Promote telecommuting at office-based businesses**

To reduce commute vehicle miles traveled, the County will work with local office-based businesses to encourage telecommuting. Telecommuting should not impede on normal business practices and, thus, may not be suitable for businesses that require physical employee attendance, such as at retail storefronts and warehouses.

**Measure TR-14 Develop and implement active transportation projects**

The County will develop and implement active transportation projects in the unincorporated County, such as roadway modifications to install bike lanes, sidewalks (in small lot residential areas), or other infrastructure that encourages and facilitates walking and bicycling. The County will work with NVRTA to implement the current countywide Pedestrian and Bicycle Master Plans and will prioritize improvements in areas where residential uses are within reasonable walking or biking distance to retail, parks, employment, or other key destinations. The County will also support existing efforts to develop multi-use trail systems (e.g., the Napa Valley Vine Trail).



Source: County of Napa

**Co-Benefits (TR-13)**

- Improved Air Quality
- Reduction in Black Carbon Emissions

**Co-Benefits (TR-14)**

- Improved Air Quality
- Reduction in Black Carbon Emissions

### **Measure TR-15 Require new development projects to evaluate and reduce VMT**

Upon approval of Policy CIR-39 in the pending update to the County's Circulation Element, all new development projects shall be required to evaluate and reduce unmitigated VMT associated with the project by at least 15 percent. Accompanying this policy in the pending Update to the Circulation Element is Action Item CIR-39.1, in which staff will update the County's Local Procedures for Implementation of CEQA to develop screening criteria for projects that would not be considered to have significant impacts to VMT.

## 3.3.3 Solid Waste

The solid waste sector accounted for 17 percent of the County's emissions in 2014. Solid waste is one of the primary sources of methane (CH<sub>4</sub>) emissions, which are classified SLCPs. Legislative reductions outside of the County's jurisdiction will reduce 2014 solid waste emissions by approximately 32 percent by 2030 and 41 percent by 2050 despite population growth, mainly due to the State's 75 percent waste diversion goal and a planned landfill gas collection project at Potrero Hills landfill, which accepted 98 percent of the County's waste in 2014. The California Department of Resources Recycling and Recovery (CalRecycle) will also begin the formal rulemaking process in 2018 to develop regulations that reduce statewide organic waste disposal by at least 50 percent below 2014 levels by 2020 and 75 percent by 2025.

When combined with legislative reductions, solid-waste measures will reduce annual GHG emissions by:

- 36 percent by 2030, and
- 47 percent by 2050.

The CAP's solid waste measures, in combination with legislative reductions, will reduce 2014 emissions in this sector by 36 percent by 2030 and 47 percent by 2050. The two primary solid waste measures aim to further reduce emissions by encouraging expansion of current composting programs in the County and exceeding the State's waste diversion target. Landfills located within the County already have landfill gas capture operations in place. Major co-benefits of solid waste measures include improved water quality and preservation of biological resources. Waste diversion and composting would reduce the need for landfill expansion, protecting natural ecosystems and habitat.

Solid waste emissions reductions depend on participation from landfills; expansion of County waste reduction, recycling, and composting programs; and participation from County residents and businesses to reduce waste and increase recycling.

Table 3-5 summarizes the solid waste primary measures, with more detailed descriptions of the measures following.



Table 3-5 Summary of Solid Waste Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Primary Measures</b>				
SW-1	Encourage expansion of composting program for both residential and commercial land uses	629	1,106	1,270
SW-2	Meet an 80 percent Waste Diversion Goal by 2020 and a 90 percent Waste Diversion Goal by 2030	1,179	2,625	3,163
TOTAL		1,807	3,731	4,433

Notes: Columns may not add to totals due to rounding.  
 GHG = greenhouse gas emissions  
 MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents  
 PG&E = Pacific Gas and Electric  
 Source: Ascent Environmental 2018

## Primary Solid Waste Measures

### *Measure SW-1 Encourage expansion of composting programs for both residential and commercial land uses*

The County will encourage expansion of current composting programs that serve the county to exceed requirements under AB 1826. Under AB 1826, no more than 50 percent of the amount of commercial organic waste landfilled in 2014 can be landfilled starting in 2020. Under this measure, the County will target a composting rate of 85 percent of all food waste and 100 percent of yard waste generated by the County by 2030.

Additionally, CalRecycle will initiate a formal rulemaking process in 2018 to develop and adopt statewide regulations to reduce organic waste as required by SB 1383. Expansion of local composting programs described under this measure could complement or be included in potential compliance mechanisms for future SB 1383 regulations, which are scheduled for adoption in late 2018 or early 2019.

### *Measure SW-2 Meet an 80 Percent Waste Diversion Goal by 2020 and a 90 Percent Waste Diversion Goal by 2030*

The County will establish a target to meet an 80 percent waste diversion goal by 2020 and a 90 percent waste diversion goal by 2030. This will exceed the State’s 2020 75 percent waste diversion target by 5 percent. Key steps include:

- completing an updated waste characterization study to analyze the distribution of waste types in the County’s generated waste and identify major waste reduction opportunities. The last waste characterization profile available for the county was available for 1999,
- supporting and expanding existing composting and recycling programs and incentives for residences and businesses, and

**Co-Benefits (SW-1)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats

**Co-Benefits (SW-2)**

- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health

- supporting and incentivizing private waste collection and landfills in reducing landfilled waste.

According to Napa Recycling, recycling rates are already at 70 percent in the City of Napa and the southern county. These actions apply to waste management areas under the County's control. Waste in Zone 3 (most areas north of Yountville) is managed by a Joint Powers Authority, the Upper Valley Waste Management Agency (UVA). The County can encourage UVA to adopt these goals but cannot itself mandate them.

### 3.3.4 Agriculture

As a leading center for viticulture, the County greatly values the contribution of the agricultural sector to the County's economy and livelihood. Accordingly, the high level of agricultural activity also presents a significant emissions reduction opportunity. Emissions from the agriculture sector, including emissions from livestock, fertilizer use, and equipment, accounted for 11 percent of the County's total emissions in 2014. No applicable legislative actions were assumed to reduce GHG emissions from agriculture; thus, agricultural emissions are anticipated to increase by about 3 percent by 2030 and 10 percent by 2050 from 2014 levels, proportional to the forecasted growth in agricultural acres.



Source: County of Napa

The CAP's measures that address agricultural emissions would prevent emissions increases from this sector and reduce 2014 emissions from this sector by about 18 percent by 2030 and 33 percent by 2050. The agriculture-related measures proposed under this strategy aim to reduce emissions from agricultural equipment, fertilizer use, and residue burning and to promote carbon sequestration through carbon farming and other sustainable agricultural practices. Emissions from agricultural equipment accounted for over 60 percent of agricultural emissions in 2014. Actions to reduce emissions from other agricultural operations were not included due to limitation in the County's jurisdiction over activities such as CH<sub>4</sub> generated from cattle (enteric fermentation) and fertilizer use necessary for cultivation. The agriculture-related measures cover the whole spectrum of co-benefits. Reduced application of inorganic nitrogen fertilizer would lead to less pollutant runoff from agricultural fields and protection of local ecosystems. Several measures would reduce the use of fossil fuels, leading to improved air quality, health benefits, and decreased reliance on non-renewable resources. These benefits are discussed in greater detail in Appendix B.

**Agriculture-related measures will reduce annual GHG emissions by:**

- 18 percent by 2030, and
- 33 percent by 2050

This strategy includes four primary measures and two supporting measures. The primary measure with the most future reductions under this strategy supports the usage of electric or alternatively-fueled equipment in lieu of gasoline- or diesel- powered equipment.

Table 3-6 summarizes the measures under the agriculture sector. Each measure is described below Table 3-6.

Table 3-6 Summary of Agriculture Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Primary Measures</b>				
AG-1	Support the conversion of stationary diesel or gas-powered irrigation pumps to electric pumps	1,696	1,792	2,009
AG-2	Support use of electric or alternatively- fueled agricultural equipment	1,617	8,540	19,149
AG-3	Support the use of Tier 4 final diesel equipment for off-road agricultural equipment	0	64	48
AG-4	Support reduced application of inorganic nitrogen fertilizer	199	420	1,130
<b>Supporting Measures</b>				
AG-5	Support BAAQMD in efforts to reduce open burning of removed agricultural biomass and flood debris	NA	NA	NA
AG-6	Encourage and support the use of carbon farming and other sustainable agricultural practices in the County	NA	NA	NA
TOTAL		3,512	10,816	22,336

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

BAAQMD = Bay Area Air Quality Management District

GHG = greenhouse gas emissions

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents

NA = Not Available

RCD = Resource Conservation District

Source: Ascent Environmental 2018

## Primary Agriculture Measures

### ***Measure AG-1 Support the conversion of stationary diesel or gas-powered irrigation pumps to electric pumps***

The County will work with PG&E, MCE, or other utilities to provide incentives to convert stationary diesel or gas-powered irrigation pumps to electric pumps that are connected to the grid or use off-grid alternative/renewable energy sources, such as solar. Electric pumps are up to 2.5 times more efficient than diesel pumps. This measure will apply to all crop types and assumes that solar alternatives to diesel and gasoline irrigation pumps are mostly viable. This measure assumes that the majority of pumps in the County will converted to electric by 2020 and that any new pumps associated with growth in agriculture will be electric.

***Measure AG-2 Support use of electric or alternatively-fueled agricultural equipment***

Farm equipment other than irrigation pumps accounted for 60 percent of agricultural emissions in 2014 and is anticipated to increase through 2050. Under this measure, the County will support the use of electric or alternatively-fueled equipment in place of gasoline or diesel equipment. The County will work with BAAQMD or the California Air Resources Board (CARB) to promote or provide financial or regulatory incentives to encourage the switch to electric or alternatively-fueled equipment. Currently-available electric equipment includes vineyard tractors, mulchers, and chainsaws; however, the range and types of such equipment will likely increase as low- or zero-emission technology advances in the future.

**Co-Benefits (AG-1, AG-2, and AG-3)**

- Improved Air Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance

***Measure AG-3 Support the use of Tier 4 final diesel equipment for off-road agricultural equipment***

The County will work with Napa Green and other entities to encourage vintners and other grower to use Tier 4 final diesel equipment<sup>2</sup>. Equipment manufacturers claim that Tier 4 final equipment may increase fuel efficiency by up to 5 percent from Tier 4 interim and Tier 3 level equipment (Caterpillar 2016, Empire Renewable Energy 2011).

***Measure AG-4 Support reduced application of inorganic nitrogen fertilizer***

The County will work with farmers to either reduce or replace the use of nitrogen-based fertilizers. Reductions can be achieved through better fertilizer management, and examples of recommended replacements include compost production from local waste management or manure from local ranches and dairies. This measure targets a fertilizer reduction rate of 5 percent by 2020, 10 percent by 2030, and 30 percent by 2050 from 2014 levels of inorganic nitrogen applied in the County. To track the progress of this measure, the County will work with the farming cooperatives or industry associations, such as the Napa Valley Grapegrowers or Napa Valley Vintners, to determine the amount of inorganic and organic nitrogen fertilizers applied per year. Measure AG-6 below will also contribute to achieving these reductions.

**Co-Benefits (AG-4)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health

## Supporting Agriculture Measures

***Measure AG-5 Support BAAQMD in efforts to reduce open burning of removed agricultural biomass and flood debris***

The County will support BAAQMD in encouraging farmers and County public services to find alternatives to open burning of agricultural, forest, and other removed biomass. The County does not have regulatory jurisdiction over open burning. Potential alternatives could

**Co-Benefits (AG-5)**

- Improved Air Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health

<sup>2</sup> In 1994, EPA established tiered rulings for diesel equipment to meet certain emission standards to be phased in over a period of time. The most recent ruling was for Tier 4 equipment, signed in 2004, which would reduce emissions of particulate matter and nitrogen oxides by over 90 percent from Tier 1 equipment.

include converting agricultural and forest waste to compost, mulch, or biochar for reapplication on cropland (see Measure AG-6 below); or, converting to biomass to energy at waste-to-energy facilities. The County may also be willing to contribute funds to support a wood waste to energy plant, should a viable project be proposed by another party. There may be instances where open burning is still the most effective tool to prevent the spread of pests and disease, and for this reason the County will support ongoing use of open burning where appropriate and in compliance with BAAQMD regulations.

***Measure AG-6 Encourage and support the use of carbon farming and other sustainable agricultural practices in the County***

The County will work with the Napa County Resource Conservation District (RCD), farmers, and other stakeholders to encourage and support the use of carbon farming and other sustainable agricultural practices in the County. The County can encourage and promote, through partnerships and education and outreach, the use of best management practices (BMPs) in farming operations to reduce emissions and sequester carbon. These BMPs include, but are not limited to, low carbon farming, low impact farming including minimizing tractor passes, low- or no-till farming, cover cropping strategies, low nitrogen usage, low water usage, composting, and use of fuel efficient equipment.

The County will set a goal to engage 10 percent of Napa County’s working lands in carbon farming by 2030. To support the increased use of carbon farming practices, the County could use Napa County RCD’s Huichica Creek Sustainable Demonstration Vineyard Carbon Farm Plan and its implementation as a pilot project for potential replication. Additionally, the County could also work with Napa County RCD and farmers to identify regional, state, and federal incentive programs, along with other funding sources and financing.

Sustainable farming practices are also supported and encouraged under Multi-Sector Strategy measures outlined later in this chapter.

### 3.3.5 Off-Road Vehicles and Equipment

Emissions from the off-road sector accounted for nine percent of the County’s total emissions in 2014, and off-road emissions are anticipated to increase by about 17 percent by 2030 and 38 percent to 2050 from 2014 levels, proportional to the forecasted growth in population and jobs.

The CAP includes two primary measures that will reduce 2014 emissions from this sector by about 2 percent by 2030 and 17 percent by 2050. The proposed measures under this strategy are focused on improving equipment efficiency and the use of alternative fuels in marine vessels. Co-benefits include improved air quality and public health, reduced reliance on fossil fuels, and protection of natural

- Co-Benefits (AG-6)**

  - Improved Air Quality
  - Improved Water Supply and Quality
  - Protection of Natural Ecosystems and Habitats
  - Improved Public Health
  - Increased Public Awareness of Climate Change



Source: County of Napa

ecosystems and habitats. These benefits are discussed in greater detail in Appendix B.

Table 3-7 summarizes the reductions from this strategy. Descriptions of the off-road primary measures follow Table 3-7.

Off-road measures will reduce annual GHG emissions by:

- 2 percent by 2030, and
- 17 percent by 2050.

Table 3-7 Summary of Off-Road Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Primary Measures</b>				
OR-1	Require Tier 4 equipment for all construction activity and mining operations as a condition for approval by 2030	0	354	386
OR-2	Promote use of alternative fuels for recreational marine vessels	1,687	7,512	22,629
TOTAL		1,687	7,867	23,014

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

GHG = greenhouse gas emissions

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents

Source: Ascent Environmental 2018

## Primary Off-Road Measures

### ***Measure OR-1 Require Tier 4 equipment for all construction activity and mining operations as a condition for approval by 2030***

The County will revise current building ordinances to require the use of Tier 4 final equipment as a condition of approval for all construction projects occurring in the county by 2030. Equipment manufacturers claim that Tier 4 final equipment may increase fuel efficiency by up to 5 percent from Tier 4 interim equipment. Because higher Tier equipment have more stringent standards, efficiency gains compared to lower Tier equipment may be greater.

#### Co-Benefits (OR-1)

- Improved Air Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance

### ***Measure OR-2 Promote use of alternative fuels for recreational marine vessels***

The County will encourage both visitors and residents to use alternative fuels in recreational boats and other recreational watercraft. The County will work with watercraft rental companies, marinas, and parks districts that operate on waterways within the County to explore ways to offset diesel or gasoline with biodiesel, ethanol, or other alternative fuels. This could include increasing the availability of alternative fuels at marinas or other fueling locations, and working with incorporated cities in the county that have jurisdiction over similar entities within city limits, as recreational watercraft docking within city limits may operate on waterways in the county.

#### Co-Benefits (OR-2)

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance

The biofuel performance targets for this measure (expressed as a percentage of total watercraft fuel consumption) are 5 percent by 2020, 20 percent by 2030, and 50 percent by 2050.

### 3.3.6 Water and Wastewater

Although water and wastewater-related GHG emissions only accounted for two percent of the County’s emissions in 2014, water conservation is needed to address serious periodic drought issues affecting Napa County and the State, in general. As discussed further in Chapter 4, drought conditions could increase in frequency and severity because of climate change over the long term.

**Water and wastewater-related GHG emissions will increase over time because projected population growth overshadows anticipated reductions in emissions from renewable energy production.**

Water and wastewater-related measures included in this Plan will reduce both the strain on water supplies and GHG emissions from pumping and treatment activities. Although electricity emission factors will decrease over time due to current legislative actions, water and wastewater-related GHG emissions would still increase by 15 percent by 2030 and 27 percent by 2050 from 2014 levels. This is due primarily to the anticipated population growth in the county overshadowing the reductions due to greater renewable energy production. The State’s water conservation plans, despite addressing the on-going drought, do not address reductions in non-urban water use by 2020 or future years.

**All water and wastewater measures also serve as adaptation measures by preserving water quality and encouraging water conservation. For a complete list of adaptation measures related to water, see Chapter 4.**

The supporting measures proposed under this strategy will reduce emissions primarily through water conservation in new and existing facilities. Most measures involve revising the County’s current ordinances that relate to water conservation. Emissions reductions from these measures rely on successful coordination with and participation from Napa County residents and businesses. The major co-benefits of water and wastewater measures is improved water supply and quality. These benefits are discussed in greater detail in Appendix B.

This strategy includes four supporting measures, all of which are qualitatively addressed. These could not be quantified due to the uncertainty related to participation rates and the types of new facilities that will be constructed. Table 3-8 summarizes the supporting measures included in this strategy. Each measure is described in further detail below.

Measure MS-2 under the Multi-Sector Strategy described later in this chapter also addresses reductions of wastewater emissions from wineries. Note that Measure MS-2, under the multi-sector strategy, includes and quantifies emissions reductions in wastewater treatment activity at wineries. However, emissions reductions from that measure are not specifically attributed to the measures under the water and wastewater strategy. Nevertheless, emission reductions from MS-2 will reduce water and wastewater-related emissions by 36 percent in 2030 and 24 percent in 2050 from 2014 levels.

Table 3-8 Summary of Water and Wastewater Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Supporting Measures</b>				
WA-1	Amend or revise water conservation regulations for landscape design	NA	NA	NA
WA-2	Adopt a new water conservation ordinance for commercial and residential land uses limiting outdoor watering	NA	NA	NA
WA-3	Expedite and/or reduce permit fees associated with water conservation installations in existing facilities	NA	NA	NA
WA-4	Require water audits for large new commercial or industrial projects and significant expansions of existing facilities	NA	NA	NA
TOTAL		NA	NA	NA

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

GHG = greenhouse gas emissions

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents

NA = Not Available

Source: Ascent Environmental 2018

## Supporting Water and Wastewater Measures

### **Measure WA-1 Amend or revise water conservation regulations for landscape design**

The County will consider expanding its existing water conservation ordinance (Chapter 18.118) to include homeowner-provided landscaping projects. Section 18.118.020 exempts home-owner provided landscaping on a residential property. This measure will limit documentation requirements for homeowners. Other potential amendments can include minimum drought tolerant plant species and cash-for-grass turf rebates.

### **Measure WA-2 Adopt a new water conservation ordinance for commercial and residential land uses limiting outdoor watering**

The County will adopt a new water conservation ordinance for commercial and residential land uses that focuses on limiting on-site outdoor and indoor water use. Requirements include:

- limiting outdoor watering to 2 days per week and having written violations for the first offense and increasing fines for each offence thereafter, waiving a second offense fee after an offender attends a 2-hour water conservation seminar;
- staggering allowable watering days on an address-number basis (e.g., even address numbers can only water on Tuesday and Saturday);

#### Co-Benefits (WA-1 and WA-2)

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Reduced Fossil Fuel Reliance



- banning most lawn and landscape watering on consecutive days and irrigation within 48 hours of measurable rainfall, similar to the City of Napa’s water conservation ordinance;
- banning outdoor car washing on certain days of the week; and
- providing educational material for residents and businesses on water conservation tips.

**Co-Benefits (WA-3)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Reduced Fossil Fuel Reliance

***Measure WA-3 Expedite and/or reduce permit fees associated with water conservation installations in existing facilities***

The County will expedite, reduce, or exempt permits and permit fees associated with water conservation installations in existing facilities. These installations can include graywater plumbing and large rainwater catchment systems.

**Co-Benefits (WA-4)**

- Improved Water Supply and Quality

***Measure WA-4 Require water audits for large new commercial or industrial projects and significant expansions of existing facilities***

The County will require water audits for large new commercial or industrial projects and significant expansions of existing facilities to identify opportunities for water conservation. The County will establish a program to follow up with the water audits and explore water conservation that are appropriate to each facility.

### 3.3.7 Land Use Change

Changes in land use can result in the reduction or loss of stored carbon and carbon sequestration potential. This occurs when trees and other vegetation on natural undeveloped lands (e.g., riparian woodland, grassland, coniferous forest, oak woodland, shrubland) are converted to agriculture (e.g., vineyards) or urban development. The net losses in carbon storage and sequestration are considered GHG emissions in the CAP, and emissions from this sector accounted for two percent of the County’s total emissions in 2014.



Source: County of Napa

The County anticipates that conversion of natural lands will increase in the future due to conversion of undeveloped lands to new or expanded vineyards or other crops, as well as increased residential and commercial development. The County’s General Plan projected that over 8,000 acres of riparian woodland, oak woodland, coniferous forests, and other natural lands will be converted to vineyards between 2005 and 2030 (Hade, pers. comm., 2015). Due to these development forecasts, land use change-related emissions will increase by nearly 137 percent by 2030 and 182 percent by 2050 compared to the baseline annual losses in 2014. These emissions are based on the annual carbon sequestration lost from the cumulative reduction in natural lands since 2014 and the annual losses in stored carbon from year-to-year reductions in natural lands. Apart from the County’s land use forecasts under its general plan, no legislative actions are currently assumed to address future changes in land use or emissions related to land use change.

The measures included under this strategy will reduce GHG emissions associated with land use change by promoting conservation of existing natural lands, tree replanting efforts, and preserving stored carbon through repurposing removed wood. These measures will not show substantial reductions in the near term due to the slow growth rates of trees over time and the larger effect in emissions from sudden loss of natural land cover. However, the CAP measures will reduce the increase in emissions from this sector from 137 to 25 percent in 2030 from 2014 levels and reduce 2014 emissions by 88 percent by 2050. Emissions reductions from these measures rely on successful administration of new programs, enforcement of County ordinances, and coordination with and participation from land use development in the County. Major co-benefits of land use change measures include improved air and water quality, and the protection of natural ecosystems and habitat. These co-benefits are discussed in greater detail in Appendix B.

Land use change will result in net GHG emissions over time due to the loss of stored carbon and sequestration potential. However, land use measures will help to reduce this net increase in annual GHG emissions by:

- 25 percent in 2030, and
- 88 percent in 2050.

This strategy includes three primary measures. The first measure, LU-1, prioritizes preservation of existing trees on lands that will be converted to urban development or agricultural use. In addition, the measure targets planting 2,500 trees per year. Such efforts will have a compounding effect on the amount of carbon dioxide (CO<sub>2</sub>) removed from the atmosphere resulting in a reduction of over 15,000 MTCO<sub>2e</sub> per year by 2050 from replanting alone.

Measure LU-2 also serves as an adaptation measure by conserving natural habitats to prevent future flooding (see Chapter 4).

Table 3-9 summarizes primary measures affecting the land use change sector. Each measure is described below Table 3-9.

Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2e</sub> /year)		
		2020	2030	2050
<b>Primary Measures</b>				
LU-1	Establish targets and enhanced programs for oak woodland and coniferous forest preservation and mandatory replanting	7,077	4,544	15,360
LU-2	Refine protection guidelines for existing riparian lands	660	660	660
LU-3	Repurpose or otherwise prevent burning of removed trees and other woody material from land use conversions of oak woodlands and coniferous forests	10,839	3,453	4,731
TOTAL		18,576	8,657	20,751

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

GHG = greenhouse gas emissions

MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalents

Source: Ascent Environmental 2018

## Primary Land Use Measures

### ***Measure LU-1 Establish targets and enhanced programs for oak woodland and coniferous forest preservation and mandatory replanting***

The County will establish a mitigation program that prioritizes preservation of existing on-site trees for land use development projects, including vineyard conversions. Trees that cannot be preserved will be required to be replaced at a 2:1 ratio, consistent with General Plan Policy CON-24. This program will primarily focus on, but will not be limited to, oak and coniferous trees. The program will target a minimum preservation rate of 30 percent of existing on-site trees. For any tree replacements, the County will encourage project applicants to prioritize replanting on the project site followed by offering off-site planting opportunities.

- Co-Benefits (LU-1)**
- Improved Air Quality
  - Improved Water Supply and Quality
  - Protection of Natural Ecosystems and Habitats
  - Improved Public Health

Considering County resources, staffing, and physical space limitations on available lands, it is assumed that an average of 2,500 replacement trees will be planted per year beginning in 2017. This target could be achieved by a combination of existing or enhanced volunteer replanting efforts (e.g., 5,000 Oaks Initiative) and compliance with the County’s 2:1 tree replacement policy.

The County will work with arborists and local conservation organizations (e.g., Napa Land Trust) to design and implement this mitigation program, along with other policies and programs that will protect or enhance the health of existing oak woodlands. Key coordination activities include determining ecologically-sound locations for tree plantings, or expanding the use of conservation easements or other efforts to protect existing oak woodlands.

### ***Measure LU-2 Refine protection guidelines for existing riparian lands***

The County will continue to enforce the County’s Conservation Regulations (County Code, section 18.108.010 B.4) that protect riparian lands and prevents conversion of riparian lands to urban development, agricultural land use, or other land use types. If appropriate, the County will develop guidelines or refine existing regulations to ensure that no net losses of riparian lands will occur. The County will work with arborists and local organizations to implement policies or programs that enhance existing riparian lands, especially those deemed unhealthy or at risk.

- Co-Benefits (LU-2)**
- Improved Water Supply and Quality
  - Protection of Natural Ecosystems and Habitats
  - Improved Public Health

### ***Measure LU-3 Repurpose or otherwise prevent burning of removed trees and other woody material from land use conversions of oak woodlands and coniferous forests***

The County will develop a program to require repurposing of usable timber from trees removed due to land use conversion and burying or chipping of non-usable timber. Repurposed wood may be used in construction or sold to local woodworking businesses or collectives with proceeds funding the administration of this measure. A minimum of 80 percent of the total removed weight of trees shall be

- Co-Benefits (LU-3)**
- Improved Air Quality
  - Improved Public Health

repurposed, buried, chipped, or otherwise prevented from burning. This measure excludes timber in commercial forests.

Land use forecasts and associated GHG emissions forecasts from vegetation losses conservatively assume that all vegetation removed due to land conversions will be burned, releasing all stored carbon as CO<sub>2</sub> into the atmosphere. The goal of this program is to prevent burning of removed biomass, thus avoiding future CO<sub>2</sub> emissions.

### 3.3.8 High-GWP Gases

High-GWP gases accounted for 13,481 MTCO<sub>2</sub>e, or approximately three percent of total emissions in 2014. High-GWP gas emissions are generated as the result of the use or leakage of refrigerants, electrical insulators in transmission lines, fumigants, and other materials. Emissions in this sector includes various types of F-gas emissions such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF<sub>6</sub>), which are also classified as SLCPs.

State and Federal regulations are reducing high-GWP gases as the result of regulations. The County will act to complement legislative actions already in place. This strategy includes two supporting measures that aim to reduce the use of high-GWP refrigerant systems.

Table 3-10 summarizes supporting measures from this strategy, with descriptions following the table.

Table 3-10 Summary of High-GWP Gases Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2</sub> e/year)		
		2020	2030	2050
<b>Supporting Measures</b>				
HG-1	Encourage registration of facilities in CARB's RMP and incentivize installation of low-GWP refrigerant systems	NA	NA	NA
HG-2	Incentivize the use of low-GWP refrigerants	NA	NA	NA
TOTAL		NA	NA	NA

**Notes:**

CARB = California Air Resources Board

GWP = global warming potential

GHG = greenhouse gas emissions

MTCO<sub>2</sub>e = metric tons of carbon dioxide equivalents

NA = Not Available

RMP = Refrigerant Management Program

Source: Ascent Environmental 2018d

## Supporting High GWP Gases Measures

**Co-Benefits (HG-1)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health

***Measure HG-1 Encourage registration of facilities in CARB’s Refrigerant Management Program and incentivize installation of low-GWP refrigerant systems***

CARB’s Refrigerant Management Program (RMP) requires facilities with refrigeration systems using over 50 pounds of high GWP refrigerant to register with the program. To reduce emissions of these refrigerants, facilities registered in the program are required to enact several BMPs including conducting periodic leak checks and detecting leaks in a timely manner. The County will encourage registration into the program and explore ways to financially incentivize the future installation of low-GWP refrigerant systems.

**Co-Benefits (HG-2)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health

***Measure HG-2 Incentivize the use of low-GWP refrigerants***

The County will consider incentivizing the use of low-GWP refrigerants in refrigeration systems or heating, ventilation, and air conditioning (HVAC) systems by expediting the permitting process or reducing permitting for new or replacement projects. The County could also pair funds with other funding sources and financing mechanisms to increase installation rates.

Because of adoption and enforcement of CALGreen Tier 1 standards under Measures BE-1 and BE-2, eligible HVAC and refrigeration equipment would not be permitted to contain hydrochlorofluorocarbons (HCFCs). Installation of HVAC systems could comply with either of the following: install HVAC and refrigeration that do not contain hydrofluorocarbons (HFCs) or do not contain HFCs with a GWP greater than 150; or install HVAC and refrigeration equipment that limit the use of HFC refrigerant through the use of a secondary heat transfer fluid with a GWP no greater than one.

### 3.3.9 Multi-Sector Strategy

In addition to identifying reduction opportunities associated with individual measures in the affected sectors, a multi-sector GHG reduction strategy looks at implementing program and policies that will reduce GHG emissions across sectors. This strategy includes four measures, one of which is primary and three of which are supporting. These measures address the overall function of activity in the County and establish a carbon offset program. The primary measure targets Napa Green certification of 100 percent of eligible wineries, vineyards, and eligible businesses in the county by 2030. This measure will reduce approximately 5,743 MTCO<sub>2e</sub> per year by 2030 and 5,737 MTCO<sub>2e</sub> per year by 2050. In addition to the environmental co-benefits of the multi-sector measures, multi-sector measures could have economic benefits for the County and its businesses.



Source: County of Napa.

Table 3-11 summarizes the primary and supporting measures that affect all sectors. Each measure is described below Table 3-11.

Table 3-11 Summary of Multi-Sector Measures				
Measure Number	Measure Name	Annual GHG Reductions (MTCO <sub>2e</sub> /year)		
		2020	2030	2050
<b>Primary Measures</b>				
MS-1	Support efforts to increase Napa Green Certified wineries and land in the County, with a goal of achieving a 100-percent certification rate for all eligible wineries and properties by 2030.	1,783	5,743	5,737
<b>Supporting Measures</b>				
MS-2	Work with other local jurisdictions within the County to develop a unified Climate Action Plan	NA	NA	NA
MS-3	Promote the sale of locally-grown foods and/or products	NA	NA	NA
MS-4	Establish a local carbon offset program in partnership with Sustainable Napa County	NA	NA	NA
TOTAL		1,783	5,743	5,737

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

GHG = greenhouse gas emissions

MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalents

NA = Not Available

Source: Ascent Environmental 2016

## Primary Multi-Sector Measures

### ***Measure MS-1 Support efforts to increase Napa Green Certified wineries and land in the County, with a goal of achieving a 100-percent certification rate for all eligible wineries and properties by 2030***

Napa Green offers two environmental certification programs, Napa Green Winery and Napa Green Land, for winery and land owners, respectively. Although Napa Green Land typically applies to vineyards, it also applies to land management of whole parcels, including any combination of farmland, natural land, and road and water ways. Green land management practices include using electrified or alternatively-fueled agricultural equipment, converting diesel-powered irrigation pumps to electric, night-shift harvesting, and using biochar as soil amendments. Together, the Napa Green Winery and Land certification programs aim to reduce solid waste generation, water use, and wastewater generation, promoting sustainable agricultural practices.

The County will support efforts to increase the number of Napa Green Certified wineries and properties in the County by including designated facilities as a favorable factor in its locational criteria when considering applications for new or expanded facilities. The County will also work with Napa Green to incentivize the replacement of CH<sub>4</sub>-emitting open air wastewater treatment ponds in certified wineries and vineyards with low-emissions treatment systems. These actions depend on the ongoing support of the Napa Valley Vintners and increased staffing in the County to support the certification program.

#### Co-Benefits (MS-1)

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance

The County will also consider highlighting Napa Green Certified wineries on appropriate websites (e.g., visitnapavalley.com). Currently, approximately 56 wineries in Napa are Napa Green Certified, representing approximately 40 percent of current annual wine production by volume in the County. Also, 40 percent of vineyard land in the County is currently Napa Green Land certified. This measure targets a participation rate of 60 percent by 2020 and 100 percent by 2030, as a function of eligible acreage or annual production by volume.

## Supporting Multi-Sector Measures

- Co-Benefits (MS-2)**
- Improved Air Quality
  - Improved Water Supply and Quality
  - Protection of Natural Ecosystems and Habitats
  - Improved Public Health
  - Reduced Fossil Fuel Reliance

### *Measure MS-2 Work with other local jurisdictions within the County to develop a unified Climate Action Plan*

Reducing GHG emissions in the entire County will require the efforts of all local jurisdictions in the County. The measures in the CAP are primarily focused on the unincorporated county. Under this measure, the County will coordinate with the incorporated cities in the County to pursue development of a unified, countywide climate action policy framework. This could result in a countywide CAP that applies to both the County and incorporated cities, or similar efforts to encourage incorporated communities to adopt their own CAPs consistent with the County’s CAP.

A comprehensive, unified CAP will improve the effectiveness of intraregional GHG reduction efforts, such as providing affordable housing in city centers and offering regional transit or rideshare solutions to wineries, vineyards, and other employment centers throughout the county.

- Co-Benefits (MS-3)**
- Improved Air Quality
  - Improved Water Supply and Quality
  - Improved Public Health

### *Measure MS-3 Promote the sale and consumption of locally-grown foods and/or products*

Developing and supporting a market for locally-grown foods or other consumer products helps to decrease transportation emissions from delivery, promotes local sustainable growing practices, and contributes to a stronger local economy. Under this measure, the County will promote the sale and use of locally grown food and/or products in the County. The County will work with local grocery stores, farmer’s markets, and restaurants to identify opportunities to reduce the supply of imported foods and to encourage local farmers to grow foods that are typically imported. Imported crops are typically off-season crops or tropical fruits for which there is little or no domestic production. The County will encourage farmers to use greenhouses or other methods to supply off-season crops during the winter.

While primarily focused on food, this measure could also be expanded to other products. For example, locally-sourced wood products developed because of Measure LU-3 implementation will help to reduce demand for wood products from more distant locations.

***Measure MS-4 Establish a local carbon offset program in partnership with Sustainable Napa County***

In coordination with Sustainable Napa County, the County will establish a local carbon offset program that allows events, persons, businesses, or institutions in Napa County to purchase credits to offset GHG emissions they generate. The funds from the sale of carbon offsets will be used to construct, develop, or operate projects that provide short or long term GHG reductions, depending on the emissions being offset. This program could be used to help implement other measures in this CAP, such as auditing and retrofitting existing buildings under applicable Building Energy sector measures; or, converting agricultural equipment to alternative fuels under measures AG-2 or AG-3.

**Co-Benefits (MS-4)**

- Improved Air Quality
- Improved Water Supply and Quality
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Reduced Fossil Fuel Reliance



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Napa County Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

## Chapter 4

# Climate Change Vulnerability and Adaptation

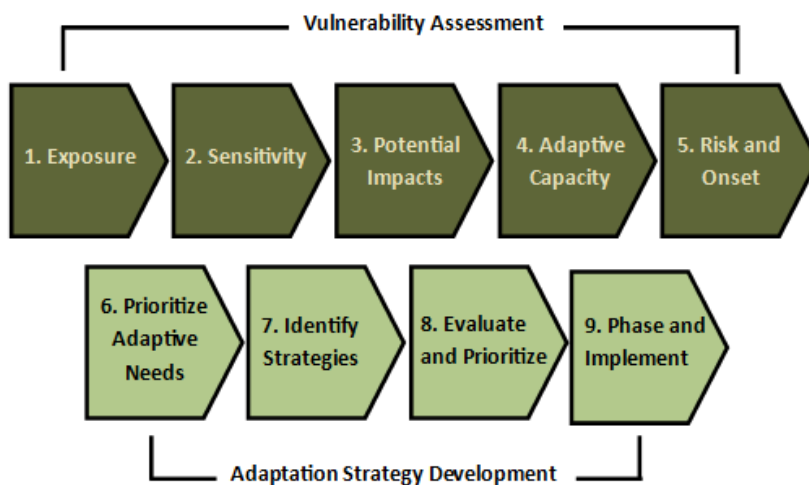
[https://upload.wikimedia.org/wikipedia/commons/8/89/Fall\\_in\\_Napa\\_Valley.jpg](https://upload.wikimedia.org/wikipedia/commons/8/89/Fall_in_Napa_Valley.jpg)  
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## 4.1 Introduction

Climate change is a global phenomenon that over the long term will have a wide variety of impacts on human health and safety, economic continuity, water supply, ecosystem function, and the provision of basic services (California Natural Resources Agency [CNRA] 2012a:3). Locally, climate change is already affecting and will continue to affect the physical environment throughout California, the Bay Area, and Napa County. For example, the 2017 California wildfire season, fueled by persistent drought in prior years followed by heavy rains and vegetation growth, and record-setting high summer temperatures, resulted in one of the most destructive wildfire seasons on record (California Department of Forestry and Fire Protection [CAL FIRE] 2017, 2018a, b, c). Because impacts of climate change vary by location and other social and economic characteristics, it is important to identify the projected severity these impacts could have in Napa County.

The California Adaptation Planning Guide (APG) provides climate adaptation planning guidance to cities, counties, and local governments. The APG, developed by the California Office of Emergency Services and CNRA, introduces the basis for climate change adaptation planning, including a nine-step process that details ways communities can reduce climate-related risks and impacts and prepare for climate change.

The nine steps in the adaptation planning process are outlined below in Figure 4-1. The first five steps of the process represent the vulnerability assessment phase, which is a method for determining the potential impacts of climate change on community assets and populations. The severity of these impacts and the community's ability to respond determine how these impacts affect a community's health, economy, ecosystems, and socio-cultural stability. Section 4.2 of this chapter summarizes the results of the vulnerability assessment prepared for the County of Napa (County). The entire vulnerability assessment can be found in Appendix C.



**Figure 4-1: The Nine Steps in the Adaptation Planning Process**

The second phase of the process is adaptation strategy development, in which effective climate adaptation strategies and measures are identified and prioritized that apply to County assets, systems or populations that may be vulnerable to climate change. These strategies and measures will help increase the County's ability to prepare for, respond to, and adapt to climate change. Climate adaptation strategies and measures for the County are included in Section 4.3 of this chapter.

## 4.2 Summary of Climate Change Effects and Vulnerability Assessment

This section summarizes the results of the vulnerability assessment prepared for the County, which includes identification of localized climate change exposure and related effects, an assessment of areas of vulnerability, a review of the County's current capacity to adapt to climate-related impacts, and consideration of how likely and how quickly impacts will occur. The completed vulnerability assessment, which follows the first five steps of APG's adaptation planning development, can be found in Appendix C.

### 4.2.1 Climate Change Effects

Where possible, climate change effects in the County are characterized for two periods of time: midcentury (around 2050) and the end of the century (around 2100). Historical data is used to identify the degree of change by these two future periods in time.

The first step in assessing vulnerability is to identify what climate change effects the County will experience in the future. To begin assessing climate change impacts over time, Cal-Adapt, a climate change scenario planning tool was used. Cal-Adapt downscales global climate simulation model data to local and regional resolution under both high and low global greenhouse gas (GHG) emissions scenarios. Results from both emissions scenarios are considered in this summary and distinguished where possible.

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

### Increased Temperatures

Annual average temperatures are projected to increase between 3.3 °F and 5.7 °F by the end of the century.

Annual temperatures in the County are projected to climb steadily. The County's historical average temperature, based on data from 1960-1990, is 58.3 degrees Fahrenheit (°F). Under the low-emissions scenario, annual average temperature is projected to increase to 61.6 °F by 2090, an increase of 3.3 °F. The annual average temperature under the high-emissions scenario is projected to increase 5.7 °F to 64.0 °F by the end of the century.

The County's average annual low temperature, based on historical data from 1960-1990, is 44.4 °F. Under the low-emissions scenario, annual low temperature is projected to increase to 48.6 °F by 2090, an increase of approximately 4.2 °F. The annual average low temperature under the high-emissions scenario is projected to increase to 50.7 °F in 2090 (i.e., an increase of approximately 6.3 °F). Historically, annual high temperatures average 70.5 °F. Annual average high temperatures are projected to increase under the low-emissions scenario by approximately 2.9 °F to 73.4 °F. Under the high-emissions scenario, annual average high temperature is projected to increase to 76.4 °F, an increase of approximately 5.9 °F.

## Increased Frequency of Extreme Heat Events and Heat Waves

In Napa County, an "extreme heat day" is defined as a day with a high temperature of at least 92 °F (California Energy Commission [CEC] 2016). Historically, the County has experienced an average of four extreme heat days a year. Because of climate change, the number of extreme heat days is projected to increase substantially by 2099. The projected annual average number of extreme heat days is expected to increase approximately 23-26 days per year in 2050, and 54-64 days per year towards the end of the 21<sup>st</sup> century.

Heat waves, which can be defined as five or more consecutive extreme heat days, have been historically infrequent in the County, with no more than two heat waves occurring in a year. However, with climate change, a significant rise in the frequency in heat waves is projected under both emissions scenarios. Under the low emissions scenario, projections show an increase of heat wave events with around three per year at the middle of the century and up to seven per year in 2090. The high emissions scenario also shows an increase in annual heat wave events, with up to five heat wave events occurring annual by midcentury and as high as 16 heat wave events occurring annually by the end of the century. Along with an increased frequency of heat events, heat waves are also projected to occur both earlier and later in the season, which historically started in late May/early June and ended in mid-September.

## Changes to Precipitation Patterns

While projections generally show little change in total annual precipitation in California and trends are not consistent, even modest changes could have a significant effect on California ecosystems that are conditioned to historical precipitation levels (CEC 2016).

While the County is not located in an area where snow typically accumulates, major water districts and utilities in the County receive a significant amount of water from the State Water Project, which depends on spring and early-summer snowmelt in the Sierra Nevada



Source: County of Napa

Heat waves have been historically infrequent in the County. However, with climate change, a significant rise in the frequency in heat waves is projected to occur.

Reduced precipitation could lead to higher risks of drought, while increased precipitation could cause flooding and soil erosion (CNRA 2014: 25).

for water supply. Additionally, agricultural water users in the unincorporated areas of the County are the primary user of groundwater (Napa County 2005:2). Increased average temperatures and changes in the timing and amounts of precipitation could affect local aquifer recharge for groundwater supplies, and thus the County could face increasing challenges of providing adequate water supplies because of increased uncertainty in the amount and timing of water availability to meet future demand. If demand exceeds supply, water users could face shortages in normal or dry years.

## Increased Wildfire Risk

Recent mitigation efforts, including adoption of the 2010 Uniform Fire Code, the Firewise Program, and the Chipping Program, have helped reduce Napa County's wildfire risk, but it is still quite vulnerable and at high-risk for wildfires (Napa County 2013: 77).

According to Napa County's Operational Area Hazard Mitigation Plan, the County has a history of wildfires. Before the 2017 wildfires, more than 200,000 acres of the County's 482,000 acres burned in the last thirty years, most of which occurred in the unincorporated areas (Napa County 2013: 12). More recently, the 2017 California wildfire season was one of the most destructive seasons on record, occurring in a year of record-setting heat and persistent drought (CAL FIRE 2017, 2018a, b, c). In October 2017, a series of wildfires broke out across Napa, Lake, Sonoma, Mendocino, Butte, and Solano Counties, burning over 245,000 acres. According to CAL FIRE and various news outlets, the fires resulted in at least 44 casualties, the hospitalization of 185 people, and the destruction of an estimated 8,900 structures (CAL FIRE 2017). Napa County was greatly impacted by the fires, with over 70,000 acres burned, and 1,200 structures damaged or destroyed, including more than 700 residences (Napa County 2018). Currently, the major wildland fire hazard risks for residential development are in the County's hilly areas characterized by steep slopes, poor fire suppression delivery access, inadequate water supply and highly-flammable vegetation (Napa County 2013: 75).

Increased temperatures and changes in precipitation patterns associated with climate change are expected to increase the risk of wildfire in the County. The 2017 California wildfire season was exacerbated by periods of persistent drought, intense winter rains, and the hottest summer in more than 100 years of record keeping. Heavy winter rainfall resulted in an abundance of vegetation, which dried out in the summer, creating hazardous fuel conditions. Under the low-emissions scenario, wildfires are 11 percent more likely to occur in 2020, compared with a baseline year of 2010, 15 percent more likely to occur in 2050, and 12 percent more likely to occur in 2085. Under the high-emissions scenario, wildfires are 14 percent more likely to occur in 2020, compared to the 2010 baseline year, 13 percent more likely in 2050, and 22 percent more likely to occur in 2085. Given that the County is currently at risk for wildfire, these increases of between 10 and 20 percent under both emissions scenarios is significant and could result in additional threats and increased vulnerability.

## Increased Likelihood of Flooding

Climate change is likely to lead to changes in the frequency, intensity, and duration of extreme events, such as sustained periods of heavy precipitation and increased rainfall intensity during precipitation events. These projected changes could lead to increased flood magnitude and frequency (Intergovernmental Panel on Climate Change [IPCC] 2001:14).

According to Napa County's Operational Area Hazard Mitigation Plan, the County is already considerably vulnerable to flooding. Flooding has caused the most disaster declarations and the most damage and loss of life historically in the County, with floods usually occurring during the season of highest precipitation or during heavy rainfall after prolonged dry periods (Napa County 2013:11). Almost all of the land adjacent to the Napa River is subject to flooding that has a one percent probability of occurring in any given year, or a 100-year flood event (Napa County 2013:58). While it is uncertain exactly how and to what extent climate change will affect flooding events in the County, it is reasonable to assume that any increase in flooding could have serious ramifications as the area is already considerably vulnerable. Additional information on increased risk of flooding, which could be exacerbated by sea-level rise in the southern portion of the County, is included below.

The County is dry during the late spring, summer, and early fall and receives most of its rain during the winter months (Napa County 2013:11).

## Sea-Level Rise

Another outcome of global climate change is sea-level rise. The southwestern portion of the County includes the mouth of the Napa River, which forms a tidal estuary that drains into San Pablo Bay. Less than one percent of the County's population is considered at risk and vulnerable to sea-level rise (CEC 2012:14 and U.S. Census 2014). Some critical infrastructure (i.e., roads, hospitals, schools, emergency facilities, and properties) are at increased risk of coastal flooding in the County. For example, the American Canyon Power Plant and the Napa Sanitation District Water Treatment Plant could become vulnerable to a 100-year flood event with 1.4 meters (m) of sea-level rise (CEC 2012:23).

Currently 140,000 people, or 2 percent of the Bay Area's population, live in areas currently at risk of being inundated in a 100-year flood event. A 1.4 m rise in sea level will put an additional 130,000 people at risk, increasing the total number of people at risk to 270,000 (CEC 2012).

Because several physical structures (i.e., levees) are currently in place to protect against a 100-year flood event, approximately 36 acres in the County are currently at risk for flooding. Taking a 1.5 m rise in sea level into account, along with other storm factors, it is projected that an additional 13,000 acres could be inundated by a 100-year flood event. The majority of area that is at risk is currently undeveloped or used for agricultural purposes. Specific areas along the Napa River that could become vulnerable include Buchli, Cuttings Wharf, Thompson, and Imola, along with areas further north along the Napa River, including some industrial uses, wineries, and parts of Downtown Napa (i.e., up to 3<sup>rd</sup> Street and portions east of State-Road 29). The Milton Road/Edgerly Island area could be lost in its



entirety if the privately-owned levy system were to fail. Additional portions of Thompson, Middleton, and American Canyon also have some flood-prone low-lying areas that would become more vulnerable to flooding because of sea-level rise. While the Napa County Airport itself is not at immediate risk for inundation from coastal flooding due to 1.5 m of sea-level rise, adjacent areas to the west are at increased risk of flooding due to sea-level rise.

## 4.2.2 Vulnerability

This section summarizes the main areas of vulnerability, in terms of structures, functions, and population to climate change exposures and impacts in the County. Vulnerability to climate change also considers the County's adaptive capacity, or the ability to currently address climate change exposures, along with how likely and how quickly impacts will occur. More detailed discussion of climate-related vulnerabilities, as they relate to the climate change exposures, can be found in Appendix C.

The County's wine industry accounts for \$10.1 billion of \$51.8 billion in economic impact from winemaking and related industries in California (Mayton 2015a).

## Agriculture and Wine Industries

Climate change could significantly impact the agricultural and wine industries, which are large drivers of the County's economy. Specifically, the wine industry in Napa, which produces an average of 4 percent of California's wine grape harvest, currently has 475 wineries, producing more than 49.7 million cases of wines totaling over \$4.5 billion dollars in sales (Napa Valley Vintners 2017 and Napa County 2013:28).

Increases in temperature and changes in precipitation and soil moisture could impact the growing of wine grapes by causing late or irregular blooming and affecting yields (Lee et al. 2013:1).

The increased likelihood of extreme floods could also lead to the destruction of crops, erosion of topsoil, and deposits of debris and sediment on crop lands. Conversely, as average temperatures increase with climate change, agricultural demand for water could intensify under extreme heat conditions, under which water evaporates faster and plants need more water to move through their circulatory systems to stay cool (CNRA 2014:21). More specifically, attempts to maintain wine grape productivity and quality in the face of warming may be associated with increased water use for irrigation, a change to different varieties of grapes, and to cool grapes through misting or sprinkling (Lee et al. 2013). As noted earlier, increased average temperatures and changes in timing and amounts of precipitation could affect local aquifer recharge for groundwater supplies in the future, which could in turn affect water supplies for agricultural uses.

The wine industry and thousands of acres of vines could also be affected by wildfire. Most wineries in Napa County were left intact after the October 2017 fires. Roughly 3,500 acres of vineyards were



Source: County of Napa

located within the fire areas; however, only 126 of those acres burned. No wineries were destroyed (Napa County 2018). In addition to direct impacts such as loss of vineyards and property, several indirect impacts could occur. The October 2017 fires took place during the peak of the winemaking season, resulting in a temporary downturn in tourism. For vineyards that are near fire-prone areas, smoke from wildfire could potentially cause problems, particularly for red grapes, where the grape skin is still used in the winemaking process. Studies have shown that wildfire smoke can potentially infuse with the grape skin and create abnormal flavors (Mayton 2015a). Furthermore, wildfires could threaten vineyards, particularly at the start of harvest season. Oftentimes when wildfires occur, evacuation orders are established by CAL FIRE, which could leave certain vineyards inaccessible for a period. Without access, grapes could remain on the vine too long and over ripen, leaving them unsuitable for winemaking (Mayton 2015b).

## Sensitive Populations

With approximately 17 percent of the County's population over the age of 65 and 33 percent of Hispanic or Latino origin, projected climate change exposures have the potential to leave sensitive populations in the County especially vulnerable to increased risk (Census 2014).

Higher frequency of extreme heat conditions can cause serious public health impacts, increasing the risk of conditions directly related to heat such as heat stroke and dehydration (CNRA 2012a: 3). Older adults, particularly seniors, are more likely to experience respiratory and/or cardiovascular health complications than younger individuals. Approximately 24,000 of the County's population are elderly, which are more likely to live alone with limited mobility, all of which can exacerbate health risks associated with extreme heat (Census 2014).

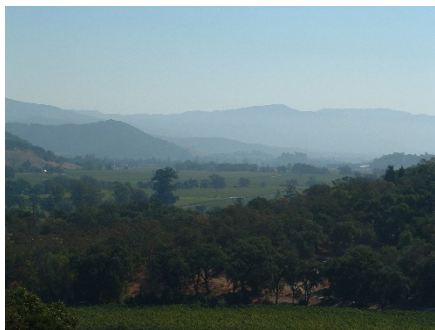
The County has a large Hispanic population, many of which are low-income agricultural workers that speak primarily Spanish. The majority of the County's large agricultural job base is of Hispanic origin. Heat stress can seriously affect those working outside, by reducing overall productivity and in extreme exposures could lead to illness, disability, or death (CNRA 2014:24). Wildfire could also negatively impact those who pick the grapes, because of the potential degradation of transportation infrastructure. Because a large number of agricultural workers cannot afford to live in the County (due to high housing costs and the lack of affordable housing), their access and mobility could be impaired.

The Hispanic population has increased from 23.7 percent in 2000 to 33.7 percent in 2014 (Census 2014).

As sea levels rise, the area and the number of people at risk because of flooding will also rise. Factors that increase vulnerability to the adverse impacts of flood events associated with sea-level rise include access to preparedness information, transportation, healthcare, and insurance. Key demographics associated with these vulnerabilities

include income, race, linguistic isolation (i.e., non-English speaking), and residential tenure (CEC 2012:8). Language ability is an important factor in assessing vulnerability as emergency response crews may be unable to communicate with non-English speakers (CEC 2012: 9). The portion of the County's Hispanic population that is low-income and that speak primarily Spanish are especially vulnerable and would be impacted by a flood event associated with sea-level rise.

Renters are also more vulnerable, as they are less likely to reinforce buildings and buy insurance because the decision to make major home improvements typically lies with the property owner. Additionally, disaster recovery services have often targeted homeowners, to the disadvantage of renters (CEC 2012:9).



Source: County of Napa

## Wildfire Threat is Likely to Increase

The County is already considered to be an area that is at high-risk for wildfires, which is only expected to increase by the end of the century (Napa County 2013:77). This increase could cause additional threats to the County and has the potential to affect emergency services, roads, water supplies to residents, housing access, and quality of life. For example, the County lost 6 percent of its housing stock in the October 2017 fires, in an already challenging housing market (Napa County 2018).

A changing climate is expected to subject forests to increased stress due to drought, disease, invasive species, and insect pests. These stressors are likely to make forests more vulnerable to catastrophic fire (Westerling 2007:231). While periodic fires are natural processes and carry out an important ecological function, catastrophic fire events that cannot be contained or managed can cause serious threats to homes and infrastructure, especially for properties located at the wildland-urban interface (i.e., where residential development mingles with wildland areas) (CAL FIRE 2009). Ecological functions are further impacted as the risk of fire increases. When it does rain in burned areas, more soil washes off the hills and into roads, ditches, and streams.



Source: County of Napa

## Flooding and Sea-Level Rise Could Make New Areas in the County Vulnerable

The County is not extremely vulnerable to sea-level rise, with less than one percent of the County's total population considered at risk (CEC 2012:14 and Census 2014). Considering a 100-year flood event, a 1.5 m rise in sea-level and other hydrodynamical factors, most of the land at increased risk for flooding is undeveloped. A small portion of critical infrastructure, such as roads, railways, hospitals, emergency facilities, and properties in the southwestern portion of the County and in areas along the Napa River, including parts of Downtown Napa, could become vulnerable. American Canyon Power

Plant and the Napa Sanitation District Water Treatment Plant could also become vulnerable (CEC 2012:23).

## Current Actions and Adaptive Capacity

The County has already begun to address many of the challenges associated with climate change through existing local policies, plans, programs, resources, and institutions.

On a planning level, the County addresses current and future impacts related to existing natural hazards, as evidenced by the creation of the County's Operational Area Hazard Mitigation Plan in 2013, which identifies current hazard risks and mitigation strategies for flooding, earthquakes, and fires. Furthermore, the County's 2008 General Plan includes policies aimed at reducing local contributions to global climate change and encourages sustainable building practices, efficient use of resources (i.e., water, land, and energy), sustainable vineyard practices, and ecological stewardship. It also covers vulnerable populations, including policies aimed at achieving more equitable outcomes for the growing low-income populations in the County, as well as its aging population that require better access to public services and housing. In Fall 2018, the County will commence a 5-year update of the Operational Area Hazard Mitigation Plan. Concurrent with the plan update, the Safety Element of the County's general plan will be updated, including any necessary updates to climate adaptation and resilience policies.

In addition to planning efforts, the County has embarked on a number of climate adaptation-related efforts, which are summarized below. The County's adaptive capacity, or the ability to adapt and reduce vulnerability to climate change, is also assessed. Adaptive capacity can be rated high, medium, or low. High adaptive capacity indicates that sufficient measures are already in place to address projected changes, while a low rating indicates a community is unprepared (CNRA 2012:26).

The County is already addressing climate change through existing policies, plans, and programs. Based on current efforts, the CAP assesses the County's adaptive capacity, or its ability to adapt and respond to projected changes.

## Efforts Related to Increased Temperature and Extreme Heat Frequency

The Napa County Health and Human Services Agency, Public Health Division, maintains an Excessive Heat Emergency Response Plan, which is designed to address current and projected changes in increased temperature, including extreme heat events and heat waves (Napa County 2009). The plan clearly outlines procedures and steps the County can take, including which other agencies to enlist for support, to effectively help the community in the event of excessive heat emergencies. While the plan can account for projected increases in temperature, it is reactive in nature and does not include potential solutions that could be put in place before extreme heat events occur. Therefore, the adaptive capacity ranking for increased temperature is considered medium.



Source: County of Napa

## Efforts Related to Water Supply and Precipitation Patterns

The County has water conservation regulations for landscape design, with the intent to conserve water through promotion of the most efficient use of water in landscape design, while respecting the economic, environmental, aesthetic, and lifestyle choices of individuals and property owners (Napa County Municipal Code Title 18, Chapter 18.118).

The County has several water conservation programs, including rebates for appliances and free-water saving devices for residents, that are helping to combat drought and other water supply issues, but the County is still currently vulnerable to water supply issues because of drought and other factors. The County will face challenges in providing sufficient water supplies in the future due to climate change effects, coupled with an increasing population (i.e., mostly in the incorporated areas) and increasing water demand. While the County has already taken steps towards achieving long-term groundwater sustainability, there is still a possibility that water supply availability may change in the future and will need to be further addressed. Therefore, the adaptive capacity ranking for changes to precipitation patterns and water supply is medium.

## Efforts Related to Flooding

The Napa River Flood Control Project will restore more than 900 acres of high-value tidal wetlands of the San Francisco Bay Estuary while protecting 2,700 homes, 350 businesses, and over 50 public properties from 100-year flood levels, a savings of \$26 million annually in flood damage costs (Napa County 2016a).

While levees and structures have been built to protect the County from a 100-year flood event, and the Napa River Flood Control Project will provide a higher level of flood protection, the County is currently not prepared to address effects associated with future sea-level rise and other hydrodynamic factors that would increase the risk of flooding. Climate change is projected to expose 13,000 additional acres to 100-year flood risk. While most of these areas are undeveloped, some developed areas are at risk and should be accounted for in future plans. Therefore, the adaptive capacity for risks associated with flooding is considered medium.

## Efforts Related to Wildfire Prevention

The County has provisions to help prevent the accumulation of combustible vegetation or rubbish that can be found to create fire hazards and potentially impact health, safety, and general welfare of the public (Napa County Municipal Code Title 8, Chapter 8.36).

The County is an area that is currently at high-risk for wildfires. Currently, the County has several programs to help prevent wildfires. The County participates in the National Fire Protection Association's (NFPA) Firewise Communities Program and has several Fire Safe Councils that are active in minimizing the potential for wildfire damage. The County is also only one of four Counties to have road standards that meet the Board of Forestry's stringent requirements. While programs and policies in place show a current capacity to address risks, the County is still vulnerable, as evidenced by the October 2017 fires. Climate change is projected to increase this current risk by anywhere from 10 to 20 percent and the County will need to continue to adapt to this projected increase. Therefore, the adaptive capacity for risks associated with wildfire is considered medium.

The County enforces the Green Building Standards Code to establish and encourage sustainable building construction practices having a positive environmental impact (Napa County Municipal Code Title 15, Chapter 15.14).

## Other Climate-Adaptation Related Efforts

The County has practices and organizations in place that help address future issues of sustainability and climate adaptation. With organizations, such as Sustainable Napa County, that educate the public and foster collaboration for longer term environmental

sustainability, the County through partnerships is finding ways to change behaviors and practices now. The County also supports the Napa Green Certification program, which aims to reduce solid waste generation, water use, and wastewater generation, promoting sustainable agricultural practices. Furthermore, by adopting the Green Building Standards Code, the County is setting a precedent for reduced energy use, building with more sustainable materials, and employing better water conservation tactics. The County also recently joined Marin Clean Energy (MCE), which allows users to purchase more renewable energy options. These efforts, however, would need to be expanded and applied on a much larger scale throughout the County to address future changes attributed to climate change. Therefore, the adaptive capacity for other climate-adaptation related efforts is medium.

## Risk and Onset

The County is committed to continuing efforts to address and reduce existing climate-related risks and future impacts on a program level. With several ordinances and programs that cover a range of climate exposures and related impacts, the County is well equipped to handle current issues of extreme heat events and water supply issues, but could still likely face increasing challenges as projected changes occur.

In terms of how likely and quickly impacts will occur, temperature related impacts are the most likely near-term climate change exposure facing the County and should be addressed and prioritized in future adaptation planning efforts. While sea-level rise has a high certainty rating and is already occurring, its onset is not expected to occur until closer to the end of the century in terms of changes in areas already vulnerable to flooding or causing permanent inundation in tidally-influenced areas of the County. Addressing increases in flooding and wildfire risk have mid-term onsets and should be prioritized accordingly.

The timeframe in which the impact is most likely to occur are defined as follows:

- Near-term: 2020-2040,
- Mid-term: 2040-2070, and
- Long-term: 2070-2100.

## 4.3 Adaptation Strategies and Measures

This section defines the strategies and measures that the County will pursue to further its climate adaptation efforts. These strategies build upon current efforts to be more sustainable, adaptive, and progressive. The County's 2008 General Plan contains several policies aimed at achieving sustainable development, reducing vehicle emissions, using resources more efficiently, and improving vineyard practices. The strategies and measures within this section define the specific steps necessary to prepare for the future effects of a changing climate. Other County plans, programs, efforts, and policies support this vision and contribute to addressing climate change issues.

See Section 4.2 Current Actions and Next Steps for more details regarding current County efforts to address climate change.

Strategies identify the primary ways to adapt to climate change impacts. Measures identify specific steps that the County will take to implement strategies.

Adaptation measures are grouped into five strategies. These strategies address the climate change impacts and vulnerabilities identified in the vulnerability assessment (i.e., temperature, wildfire, precipitation, flooding, and sea-level rise). Within each strategy are a series of measures that define the programs, policies and regulations the County will implement to remain responsive to the challenges created by climate change. Consideration for how likely and how soon impacts are expected to occur are included, with specific attention given to those exposures that pose the most serious and near-term threats to the County. This includes identifying responsible County departments and an implementation timeframe for each measure. More detailed discussion on implementation and monitoring of the CAP can be found in Chapter 5.

Adaptation strategies also have the potential to provide other important benefits to the community, or co-benefits, such as improved air quality, water supplies, biological resources, public health outcomes, and beneficial outcomes for non-renewable energy resources. For example, several adaptation measures would help to curb the urban heat island effect while also strengthening education and awareness about extreme heat and health, thus reducing the incidence of heat-related illness. Flood protection measures would increase resilience to flood-events while also restoring and protecting riparian habitats, resulting in ecological co-benefits. Often, those who are most vulnerable to the impacts of climate change are the ones who have the fewest resources to deal with these issues. Adaptation strategies that focus on identifying and targeting vulnerable populations would also provide health equity co-benefits. Co-benefits are identified within each strategy, where applicable. And finally, GHG reduction measures previously identified in Chapter 3 that also contribute to adaptation are discussed, where appropriate.

Below are the five strategies included in this section:

The five adaptation strategies address the climate change impacts and vulnerabilities identified in Section 4.2:

- temperature,
- wildfire,
- precipitation,
- flooding, and
- sea-level rise.

- Prepare for Increases in Average Temperatures and Extreme Heat Events,
- Prepare for Increased Risk of Wildfire,
- Prepare for Variable Water Supplies and Preserve Water Quality,
- Prepare for Increased Likelihood of Flooding, and
- Prepare for Sea-Level Rise.

### 4.3.1 Prepare for Increases in Average Temperatures and Extreme Heat Events

Temperature-related impacts because of climate change are likely to affect the County in several ways. Increased average temperatures, along with more frequent extreme heat events, are likely to exacerbate already high temperatures, in what are known in developed areas as urban heat islands. Built-up areas, which tend to have a prominence of asphalt and less vegetation, create, intensify and retain heat. To help curb the effects of urban heat islands in developed areas, the County will incorporate “green” infrastructure into new development and developing areas. Examples of green infrastructure include planting trees, climate-appropriate landscaping, rain gardens, and rooftop gardens. The County will also incorporate cool pavement and rooftop technology in new and existing developments, while also including more shade trees in parking lots.

With increased average temperatures and more frequent extreme heat events, energy demand is likely to increase. A number of GHG-reduction measures (see Chapter 3) also serve as climate adaptation measures. For example, improving energy efficiency and reducing energy demand in buildings today will help to mitigate future increases in energy demand as average temperatures rise and more extreme heat events occur. GHG-reduction measures include working on increasing energy efficiency in new and existing buildings, by requiring compliance with CALGreen Tier 1 Standards (GHG Measures BE-1 and BE-2), increasing participation in MCE’s Deep Green option for renewable energy (GHG Measures BE-3 and BE-6), and incentivizing energy efficiency improvements (GHG Measures BE-5 and BE-8).

Understanding that health-related risks increase along with average temperatures, the County will continue to work with the Health and Human Services Agency, along with other departments to ensure that the proper outreach programs and plans are in place to deal with heat-related illnesses and that the agricultural sector is equipped to withstand a changing climate.

Measures related to temperature are described below and summarized in Table 4-1 below.

#### ***Measure Temp-1 Map Critical Infrastructure Locations Vulnerable to Extreme Heat Events***

Map locations of communication, energy, service, and transportation infrastructure that are vulnerable to extreme heat events.



Source: County of Napa

**All GHG Building Energy measures serve as adaptation measures by reducing overall energy demand. For a complete list of measures related to building energy, see Chapter 3.**



***Measure Temp-2 Develop Outreach Programs for Outdoor Workers***

Work with labor organizations, the agriculture and wine community, and County and State health and safety agencies to publicize programs and standards for preventing heat-related illness in employees who work outdoors.

***Measure Temp-3 Educate Residents on Heat-Related Illness Prevention***

Develop education outreach materials to publicize methods for preventing heat-related illness during heat waves.

***Measure Temp-4 Encourage the installation of Cool Roof Technologies and Rooftop Gardens***

Encourage and explore ways to incentivize the installation of cool roof technologies and, where appropriate, rooftop gardens in residences and commercial buildings.

***Measure Temp-5 Incorporate Cool Pavement Technology***

Explore options to incorporate cool pavement technology into both the regular maintenance of existing and construction of new roads, sidewalks, parking areas, and bike lanes.

***Measure Temp-6 Improve Parking Lot Shading and Landscaping***

Explore options to improve parking lot shading requirements in new construction and to promote planting of additional trees and landscaping in existing parking lots.

***Measure Temp-7 Update the County's Excessive Heat Emergency Response Plan***

Coordinate with the Napa County Health and Human Services Agency, Public Health Division, to maintain and update the County's Excessive Heat Emergency Response Plan to better prepare for increased extreme heat days and more frequent and intense heat waves.

***Measure Temp-8 Support and Monitor Research on the Effects of a Warmer Climate on the Agriculture and Wine Industries***

Support and monitor ongoing research on the potential effects of a warmer climate on the agriculture and wine industry by existing organizations and groups, including but not limited to, Napa Valley Vintners and the California Climate and Agriculture Network.

***Measure Temp-9 Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Temperatures***

Work with grape growers to understand the tolerance of current wine grape crop mixes to withstand increased temperatures, and explore options to shift the types of grape varieties to suit changing environments.

***Measure Temp-10 Develop Outreach Programs for Winemakers***

Develop outreach programs to inform and assist winemakers in changing practices to adapt to the effects of climate change (e.g., increasing

**Co-Benefits:**

- Reduced Energy Demand
- Reduced Energy Bills
- Reduced Building and Operating Costs
- Reduced Fossil Fuel Reliance
- Improved Air Quality
- Improved Public Health
- Improved Quality of Life
- Increased Public Awareness of Climate Change

average temperatures, variation in water supplies, etc.). Techniques could include, but are not limited to, providing artificial shade and limiting light exposure on grapevines during extreme heat events.

### **Measure Temp-11 Develop and Implement Strategies to Increase Energy Resiliency**

Work with MCE and PG&E to develop and implement strategies to increase energy resiliency in the face of extreme events (e.g., extreme heat events, damages due to wildfire, flooding, and sea-level rise). Strategies could include, but are not limited to, battery storage and back-up systems, creating grid flexibility through increased renewable energy development, and identifying design weaknesses in energy infrastructure.

Creating a more resilient energy system will increase reliability and help ensure uninterrupted access to critical resources like power and water. GHG Building Energy measures also help to increase energy resiliency by reducing the County's overall energy demand and diversifying regional sources of renewable power generation.

Measure	Title	Responsibility	Timeframe
Temp-1	Map Critical Infrastructure Locations Vulnerable to Extreme Heat Events	Planning and Public Works	Near-Term
Temp-2	Develop Outreach Programs for Outdoor Workers	Planning & Public Health Division	Near-Term
Temp-3	Educate Residents on Heat-Related Illness Prevention	Planning & Public Health Division	Near-Term
Temp-4	Encourage the installation of Cool Roof Technologies and Rooftop Gardens	Planning	Near-Term
Temp-5	Incorporate Cool Pavement Technology	Planning	Mid-Term
Temp-6	Improve Parking Lot Shading and Landscaping	Planning	Near-Term
Temp-7	Update the County's Excessive Heat Emergency Response Plan	Planning & Public Health Division	Mid-Term
Temp-8	Support Research on the Effects of a Warmer Climate on the Agriculture and Wine Industries	Planning & the Agriculture Commissioner's Office	Near-Term
Temp-9	Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Temperatures	Planning & the Agriculture Commissioner's Office	Mid-Term
Temp-10	Develop Outreach Programs for Winemakers	Planning & the Agriculture Commissioner's Office	Mid-Term
Temp-11	Develop and Implement Strategies to Increase Energy Resiliency	Planning and Public Works	Mid-Term

Note: Near-Term: 1-3 Years, Mid-Term: 4-8 Years, Long-Term: 8+ Years

Source: Ascent Environmental 2016

## 4.3.2 Prepare for Increased Risk of Wildfire

With the County already at high risk for wildfire, it is imperative that the County prepare for increased wildfire risk as a result of climate change. The Napa County Fire Department currently has mutual aid agreements with American Canyon, the City of Napa, St. Helena, and Calistoga, forming the Napa County Firefighters Association (Association). The County will continue to collaborate with the Association and other pertinent agencies to coordinate strategies to ensure a cohesive County-wide approach to wildfire risk management.

GHG Measure AG-5 will help to reduce the risk of fire spreading (see Chapter 3).

Additionally, GHG Measure AG-5, which supports BAAQMD efforts to reduce open burning of removed agricultural biomass and flood debris, will help to reduce the risk of fire to spread and become hazardous threats. Wildfire is also the largest source of black carbon in California, harmfully impacting both public health and the climate (CARB 2017). An added co-benefit of reducing fire hazard risks and building resiliency through wildfire-related adaptation measures, is that less black carbon will be emitted into the atmosphere.

All wildfire-related measures are described below. Summaries of the measures are included in Table 4-2 below.

**Co-Benefits:**

- Protection of Structures and Assets
- Improved Air Quality
- Reduction in Black Carbon Emissions
- Protection of Natural Ecosystems and Habitats
- Improved Public Health
- Improved Quality of Life
- Increased Public Awareness of Climate Change

***Measure Fire-1 Map and Identify Locations That Are Newly at Risk, or at Higher Risk for Fire Hazards***

Work with CAL FIRE and the Napa County Fire Department to map and identify locations in the County that are newly at risk, or at higher risk, for fire hazards because of climate change and its impacts.

***Measure Fire-2 Map Critical Infrastructure Locations Vulnerable to Wildfires***

Map locations of communication, energy, service, and transportation infrastructure that are vulnerable to wildfires.

***Measure Fire-3 Collaborate with the Napa County Firefighters Association in the Dissemination of Information***

Collaborate with the Napa County Firefighters Association to disseminate information regarding the nexus between climate change and increased wildfire risk to identify opportunities for County-wide coordination efforts.

***Measure Fire-4 Coordinate Emergency Preparedness Systems***

Coordinate with the Napa County Firefighters Association and the Office of Emergency Services to identify strategies to ensure capacity and resilience of escape routes compromised by wildfire, including emergency evacuation and supply transportation routes.

***Measure Fire-5 Collaborate on Programs to Reduce Fire Hazards***

Collaborate with the Napa County Fire Department to continue to reduce fire hazards, including but not limited to, enforcing defensible space guidelines, restoring fire-resilient conditions by thinning, removing live or dead vegetation, and retaining healthy native trees.

The Napa County Firefighters Association is a joint agency comprised of fire departments in Napa County, American Canyon, City of Napa, St. Helena, and Calistoga (Napa County 2016b).

Measure	Title	Responsibility	Timeframe
Fire-1	Map and Identify Locations That Are Newly at Risk, or at Higher Risk for Fire Hazards	Planning, Napa County Fire Department, & CAL FIRE	Near-Term
Fire-2	Map Critical Infrastructure Locations Vulnerable to Wildfires	Planning, Public Works, & Caltrans	Mid-Term
Fire-3	Collaborate with the Napa County Firefighters Association in the Dissemination of Information	Planning & Napa County Firefighters Association	Mid-Term
Fire-4	Coordinate Emergency Preparedness Systems	Planning, Napa County Firefighters Association, & Office of Emergency Services	Mid-Term
Fire-5	Collaborate on Programs to Reduce Fire Hazards	Planning & Napa County Fire Department	Near-Term

Note: Near-Term: 1-3 Years, Mid-Term: 4-8 Years, Long-Term: 8+ Years

Source: Ascent Environmental 2016

### 4.3.3 Prepare for Variable Water Supplies and Preserve Water Quality

Climate change effects will result in variable water supplies and an increased need to preserve water quality in Napa County. To prepare for these conditions, the County will continue to evaluate the vulnerabilities of its water supply systems and networks, while also identifying innovative options to meet future water demand.

Several GHG reductions measures also serve as adaptation strategies. GHG Measure LU-2, refines protection guidelines for existing riparian lands, further preserving areas and water quality. Additional water related GHG measures cover a range of water conservation tactics, including regulations for landscape design (GHG Measure WA-1), adopting ordinances that limit outdoor watering for commercial and residential land uses (GHG Measure WA-2), and requiring audits for new large-scaled projects and existing facilities (GHG Measure WA-4). GHG Measure WA-3, expedites and reduces permit fees associated with water conservation installations, including rainwater catchment systems, which are also encouraged in Adaptation Measure Water-3 below.

All GHG Water measures serve as adaptation measures by preserving water quality and encouraging water conservation. For a complete list of measures related to water, see Chapter 3.

Additionally, the County will pursue future grant opportunities to continue efforts related to provide enough water supplies in the future, and support local efforts from Napa Green Land to increase water efficiency in agricultural lands in the County.

All measures related to water supply and quality are described below and summarized in Table 4-3 below.

**Co-Benefits:**

- **Reduced Water and Sewer Bills**
- **Improved Water Supply and Quality**
- **Increased Public Awareness of Climate Change**



Source: County of Napa

***Measure Water-1 Evaluate Vulnerabilities of Water Supply Systems and Networks***

Evaluate the vulnerability of the water supply systems and networks to climate change related impacts and develop strategies to increase the resilience of these systems.

***Measure Water-2 Consider Innovative Options to Meet Future Demand***

Consider innovative options to meet future water demand (e.g., on-site graywater systems; institute water conservation strategies; and use of recycled water).

***Measure Water-3 Promote Use of Rainwater Catchment and Storage Systems***

Promote the use of catchment systems, such as rain barrels, rain gardens, cisterns, and other mechanisms to capture and store rainwater.

***Measure Water-4 Support Napa Green Land Certification Efforts***

Support efforts of the Napa Green Land certification program for agriculture and farm land to prevent soil erosion, reduce harmful inputs and runoff, restore wildlife habitats, and support healthy rivers, streams, and riparian vegetation to maintain water quality and conserve water resources. See also GHG reduction measure MS-1 in Chapter 3, which establishes a goal for 100 certification for all eligible properties in the Napa Green certification programs.

***Measure Water-5 Collaborate with Agencies to Identify Future Water Supplies and Explore Alternative Supply Sources***

Collaborate with the Napa County Flood Control and Water Conservation District and Public Works, to identify water supply options for the future. Explore opportunities to expand the use of on-site graywater systems, recycled water systems, or other alternative supply sources to meet non-potable water demands, and where possible, to offset groundwater and/or potable use.

***Measure Water-6 Pursue Grant Funding Opportunities for Water Resource Planning Projects***

Pursue grant funding opportunities related to on-site graywater reuse systems, water recycling projects, and/or other water resource planning projects.

Measure	Title	Responsibility	Timeframe
Water-1	Evaluate Vulnerabilities of Water Supply Systems and Networks	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Near-Term
Water-2	Consider Innovative Options to Meet Future Demand	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Mid-Term
Water-3	Promote Use of Rainwater Catchment Systems	Planning & Public Works	Mid-Term
Water-4	Support Napa Green Land Certification Efforts	Planning	Near-Term
Water-5	Collaborate with Agencies to Identify Future Water Supplies and Explore Alternative Supply Sources	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Mid-Term
Water-6	Pursue Grant Funding Opportunities for Water Resource Planning Projects	Planning & Public Works	Mid-Term

Note: Near-Term: 1-3 Years, Mid-Term: 4-8 Years, Long-Term: 8+ Years  
 Source: Ascent Environmental 2016

### 4.3.4 Prepare for Increased Likelihood of Flooding

Through a variety of measures, the County will prepare for the increased likelihood of flooding. The County will work with local agencies and organizations to reduce the effects of flooding by improving and mapping critical infrastructure. On a larger County-wide level, the County is committed to partner with incorporated cities to address flooding collectively, paying attention to areas at increased flooding risk along the Napa River.

The County will also use several measures to restore the natural environment to combat flooding. Identifying streamside areas that could be restored will not only buffer buildings, roads, and crops from floods, but will also improve natural landscapes and air quality.

Additionally, GHG reduction Measure LU-2 which refines protections guidelines for existing riparian lands, also serves as an adaptation strategy.

GHG Measure LU-2 will help conserve natural habitats to prevent future flooding (see Chapter 3).

Measures related to flooding are described below and summarized in Table 4-4 below.

#### ***Measure Flood-1 Update the County's Operational Area Hazard Mitigation Plan to Address Flooding and Climate Change***

Ensure that future updates to the County's Operational Area Hazard Mitigation Plan incorporate strategies to address the increased likelihood of flooding because of climate change.

***Measure Flood-2 Partner with Incorporated Towns and Cities and Local Organizations to Address Flooding***

Partner with incorporated cities in the County and local organizations, such as the North Bay Climate Adaptation Initiative, to ensure coordinated efforts are taken to reduce threats to structures, populations, and functions because of flooding, particularly along the Napa River.

***Measure Flood-3 Identify Potential Streamside Restoration Areas***

Identify potential streamside areas in the County that could be restored by stabilizing stream banks and planting appropriate vegetation to buffer buildings, roads, and crops from floods.

***Measure Flood-4 Encourage Replanting Bare or Disturbed Areas***

Encourage the replanting of bare or disturbed areas to reduce runoff, improve water uptake, and reduce erosion and sedimentation in streams.

***Measure Flood-5 Coordinate Emergency Evacuation and Supply Transportation Routes***

Coordinate emergency evacuation and supply transportation routes with the County's Office of Emergency Services to ensure capacity and resilience of escape routes compromised by flooding.

***Measure Flood-6 Improve Sewage and Solid-Waste Management Infrastructure***

Improve sewage and solid-waste management infrastructure, to the extent such infrastructure is within the jurisdiction of the County, to reduce vulnerabilities to climate change (i.e., storm surge, flooding, and inundation).

***Measure Flood-7 Improve Capacity of Storm Water Infrastructure***

Evaluate and improve capacity of storm water infrastructure for high intensity rainfall events.

***Measure Flood-8 Increase Use of Pervious Pavements and Landscaping in Developed Areas***

Increase the use of pervious pavements and landscaped areas to allow for better infiltration and reduced stormwater overflow in developed areas.

***Measure Flood-9 Map Critical Infrastructure Locations Vulnerable to Flooding***

Map locations of communication, energy, service, and transportation infrastructure that are vulnerable to floods and storm surges.

***Measure Flood-10 Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Flooding***

Work with the agriculture sector to understand the tolerance of current wine grape varieties to withstand increased flooding, and explore

**Co-Benefits:**

- Protection of Structures and Assets
- Protection of Natural Ecosystems and Habitats
- Improved Air Quality
- Improved Public Health
- Improved Quality of Life



Source: County of Napa

options to shift the types of grape varieties to suit changing conditions.

### **Measure Flood-11 Design Programs to Address Vector- and Waterborne Diseases**

Design programs to monitor and prepare for the appearance of vector- and waterborne diseases following floods and storms.

Measure	Title	Responsibility	Timeframe
Flood-1	Update the County's Operational Area Hazard Mitigation Plan to Address Flooding and Climate Change	Planning & Office of Emergency Services	Near-Term
Flood-2	Partner with Incorporated Towns and Cities and Local Organizations to Address Flooding	Planning & Incorporated Cities <sup>1</sup>	Mid-Term
Flood-3	Identify Potential Streamside Restoration Areas	Planning & Public Works	Near-Term
Flood-4	Encourage Replanting Bare or Disturbed Areas	Planning	Mid-Term
Flood-5	Coordinate Emergency Evacuation and Supply Transportation Routes	Planning & Office of Emergency Services	Mid-Term
Flood-6	Improve Sewage and Solid-Waste Management Infrastructure	Planning & Public Works	Mid-Term
Flood-7	Improve Capacity of Storm Water Infrastructure	Planning & Public Works	Mid-Term
Flood-8	Increase Use of Pervious Surfaces and Landscaping in Developed Areas	Planning	Mid-Term
Flood-9	Map Critical Infrastructure Locations Vulnerable to Flooding	Planning	Near-Term
Flood-10	Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Flooding	Planning & the Agriculture Commissioner's Office	Mid-Term
Flood-11	Design Programs to Address Vector- and Waterborne Diseases	Planning and Public Health Division	Mid-Term

Note: Near-Term: 1-3 Years, Mid-Term: 4-8 Years, Long-Term: 8+ Years

<sup>1</sup> Includes American Canyon, Calistoga, City of Napa, St. Helena and Yountville.

Source: Ascent Environmental 2016

## 4.3.5 Prepare for Sea-Level Rise

The County will coordinate with several agencies, including the Federal Emergency Management Agency (FEMA) Region IX, DWR, Napa County Public Works, and Napa County's Office of Emergency Services to prepare for the projected effects of sea-level rise. Measures include identifying specific areas in the County that will be affected by sea-level rise and establishing measures to protect functions, structures and populations. In addition to supporting ongoing research and analysis of sea-level rise and its effects on the County, the County will incorporate sea-level rise effects into its future planning efforts. The County will also through an outreach strategy,



Source: County of Napa



educate and inform residents of potentially affected areas of the need to plan for sea-level rise.

Measures related to sea-level rise are described below and summarized in Table 4-5 below.

***Measure SLR-1 Identify Areas Affected by Sea-Level Rise***

Conduct a detailed sea-level rise assessment to identify and inventory areas that will be affected by sea-level rise and establish measures to protect functions, structures, and populations.

***Measure SLR-2 Update the County's Operational Area Hazard Mitigation Plan to Incorporate Sea-Level Rise***

Ensure that future updates to the County's Operational Area Hazard Mitigation Plan incorporate sea-level rise assessment and risk management processes.

***Measure SLR-3 Floodplain Mapping Coordination***

Coordinate with FEMA and DWR to ensure that floodplain mapping for potentially affected areas are regularly updated to reflect changes in Base Flood Elevations that account for sea-level rise.

***Measure SLR-4 Support and Monitor Ongoing Analysis of Sea-Level Rise Data***

Support and monitor ongoing collection and analysis of sea-level rise, storm surge, and tidal data by existing institutions, including, but not limited to FEMA, the Bay Conservation Development Commission, the Bay Area Regional Collaborative, and the National Oceanic and Atmospheric Administration.

***Measure SLR-5 Create a Comprehensive Outreach Strategy***

Create a comprehensive outreach strategy that informs residents in potentially affected areas of County efforts to protect and increase community resiliency to sea-level rise.

***Measure SLR-6 Incorporate Sea-Level Rise Effects into Capital Improvement Plans***

Update capital improvement plans for critical infrastructure to address the effects of future sea-level rise and associated hazards in potentially affected areas.

***Measure SLR-7 Assess Sea-Level Rise Impacts on Agriculture***

Conduct a more detailed assessment of the impacts sea-level rise, severe storms, and increased risk of coastal flooding on the County's agriculture sector.

**Co-Benefits:**

- Protection of Structures and Assets
- Improved Public Health
- Improved Quality of Life
- Increased Public Awareness of Climate Change

<b>Table 4-5 Summary of Sea-Level Rise Measures</b>			
<b>Measure</b>	<b>Title</b>	<b>Responsibility</b>	<b>Timeframe</b>
SLR-1	Identify Areas Affected by Sea-Level Rise	Planning	Mid-Term
SLR-2	Update Napa County's Operational Area Hazard Mitigation Plan to Incorporate Sea-Level Rise	Planning & Office of Emergency Services	Near-Term
SLR-3	Floodplain Mapping Coordination	Planning, FEMA & DWR	Near-Term
SLR-4	Support Ongoing Analysis of Sea-Level Rise Data	Planning	Near-Term
SLR-5	Create a Comprehensive Outreach Strategy	Planning	Mid-Term
SLR-6	Incorporate Sea-Level Rise Effects into Capital Improvement Plans	Planning & Public Works	Mid-Term
SLR-7	Assess Sea-Level Rise Impacts on Agriculture	Planning	Mid-Term

Note: Near-Term: 1-3 Years, Mid-Term: 4-8 Years, Long-Term: 8+ Years

Source: Ascent Environmental 2016

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Napa County Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

## Chapter 5 Implementation and Monitoring



## 5.1 Introduction

This chapter outlines in detail how the County of Napa (County) will implement and monitor the Climate Action Plan (CAP) strategies and measures over time to reduce greenhouse gas (GHG) emissions and adapt to climate change. To achieve the GHG emissions reductions and adaptation strategies described in Chapters 3 and 4, measures must also be continuously assessed and monitored to ensure that: (1) the measures are effective; (2) the CAP is on track to achieve the GHG reduction targets; and (3) desired community outcomes are attained.



Source: County of Napa

## 5.2 Implementation Strategy

Achieving the 2020 and 2030 GHG reduction targets will require implementation of the strategies and measures identified in the CAP. Ensuring that the measures translate to on-the-ground results and reductions in GHG emissions is critical to success. It requires careful consideration of the operational and capital resources needed to implement the CAP, as well as the overall timing, phasing, and monitoring of implementation.

This chapter describes how County staff will implement the CAP, and how the CAP will be monitored and updated over time to ensure continued effectiveness and relevance of the document.

The monitoring strategy outlined below serves as initial guidance for County staff in monitoring progress towards established goals. Monitoring and assessment of the CAP implementation process will provide key insights into which strategies and measures have been most successful in terms of implementation and GHG reductions and will inform policy and strategy development for future CAP updates.

The County will implement strategies and measures of the CAP through several types of programs and activities that can be grouped into the following categories:

- **Code Updates.** Several of the measures in the CAP are implemented through new or amended regulations as part of County Code updates. The County, for example, will need to incorporate the California Green Building Standards Code (CALGreen) Tier 1 “reach code” into the County’s local building code, along with requiring that new or replacement residential water heating systems be electrically-powered and/or alternatively-fueled systems.
- **Financing and Incentives.** Identifying mechanisms for funding and allocating resources, such as expanding current green energy incentives, will help ensure that the CAP is successfully implemented.
- **Program Research and Development.** Several measures are programmatic in nature and will require additional research and development for proper implementation to occur (i.e., developing programs to address vector- and waterborne diseases). These programs may require future partnerships



Source: County of Napa

and financing mechanisms to be in place down the road, but most immediately, County staff will need to integrate program research and development into the context of existing workloads and programs whenever possible.

- **Partnerships.** Inter-agency coordination and partnerships with other organizations is critical to ensuring implementation of certain measures (i.e., developing a region-wide CAP, increasing Napa Green Certified wineries, or supporting efforts to allow commuter service to operate on the Napa Wine Train right-of-way).
- **Education and Outreach.** Education efforts about the objectives of the CAP will create support for the CAP and involve the community in its implementation.

Low cost measures are those that have low County administrative costs, can be subsidized, or compared to other measures have lower start-up costs. High cost measures are those that consume a substantial portion of local government budget or would require extensive infrastructure to implement.

Table 5-1 summarizes the implementation strategy for the CAP. More specifically, for each GHG reduction and adaptation measure, the table identifies the following information:

- **Responsibility.** Identifies County departments that will be responsible for implementing assigned actions upon adoption of the CAP. Because some measures will require interdepartmental or inter-agency cooperation, appropriate partnerships have been initially identified.
- **Timeframe.** The estimated timeframe for implementing each measure. Measures are categorized as Near-Term (will occur within 1-3 years), Mid-Term (will occur within 4-7 years), by 2030, or Ongoing (already occurring).
- **General County Implementation Costs.** Relative County costs required to implement each measure are represented by an order of magnitude category (i.e., Low, Medium, High) . These categories are based on the anticipated level of resources, staffing, and time required to implement each measure. The general cost category is not intended to represent the relative costs of compliance, but rather focused on the County’s costs to facilitate program development and implementation. For a more specific discussion of the relative costs and benefits of compliance with individual measures, see Appendix B.
- **Estimated County Staff Time.** Staffing requirements for the County are presented in terms of the estimated number of full-time equivalent (FTE) employees needed to implement and coordinate CAP measures over one fiscal year. In some cases, the FTE estimates could be absorbed into existing work programs, while in other cases new work programs and associated staff positions could be required. More detailed estimates of staffing and program costs will be developed during implementation of specific measures.
- **Category.** Identifies the implementation category for each measure (i.e., Code Updates, Financing and Incentives, Program Research and Development, Partnerships, and Education and Outreach).

Full-time equivalent (FTE) in this context represents the proportion of time that one employee working on a full-time basis (i.e., 40 hours a week) would devote to implementing the CAP over the course of one fiscal year.

- **Applies to Projects Seeking CEQA GHG Streamlining.**  
Distinguishes which measures would be required for future development projects seeking to tier and streamline from the CAP during California Environmental Quality Act (CEQA) review. See Section 5.2.1 below and Appendix D for additional details.
- **Implementing Actions and Other Considerations.**  
Summarizes the key actions County staff will take, partnership or collaboration needs, generalized costs and benefits of compliance, and other considerations for measure implementation and monitoring.

The County will develop more detailed implementation schedules for each measure, based on staff requirements and funding opportunities available for implementing the measures outlined in the CAP. Implementation of the CAP will require inter-departmental collaboration and key staff in each department will facilitate and oversee action implementation. Priority will be given to programs based on cost effectiveness, GHG reduction potential, available funding, and the ease and length of time for implementation.

Proper implementation and tracking of the CAP allows County staff, the Board of Supervisors, and the public to monitor the effectiveness of each measure as well as the overall CAP.

The County will incur costs to implement some of the measures outlined in the CAP. These include initial start-up, ongoing administration, and enforcement costs. While some measures will only require funding from public entities, others will result in increased costs for businesses, new construction, and residents. However, most measures provide substantial cost-savings in the long term. The County will be diligent in seeking cost-effective implementation, strategic funding opportunities, and the use of partnerships to share costs.

## 5.2.1 Role of New Development

Implementation of the CAP will require that new development projects attain higher levels of energy efficiency and incorporate more sustainable design standards. However, new developments that are consistent with applicable GHG reduction measures in a CAP are eligible for CEQA streamlining, per the provisions of CEQA Guidelines Section 15183.5. Under these provisions, if a project can show consistency with applicable GHG reduction measures in a CAP, the level of analysis for the project required under CEQA with respect to GHG emissions can be reduced considerably (i.e., detailed analysis of project-level GHG emissions and potential climate change impacts is not needed). Furthermore, a project's incremental contribution to cumulative GHG emissions may be determined not to be cumulatively considerable. This CAP meets the criteria identified in Section 15183.5 and is therefore considered a "qualified" CAP.

The CAP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the CAP.

To help new development applicants plan and design projects consistent with the CAP, and to assist County staff in determining the consistency of proposed projects with the CAP during development



review, the County has prepared a CAP Consistency Checklist (See Appendix D). The Checklist incorporates the GHG reduction measures that could be feasibly applied to future projects subject to discretionary review and are noted in Table 5-1 below.

The Checklist may also be updated to incorporate new GHG reduction techniques or to comply with later amendments to the CAP or local, State, or Federal law. By incorporating applicable GHG reduction measures in the Checklist into project designs or conditions of approval, the County will ensure that new development is consistent with applicable GHG reduction measures in the CAP and thus will contribute its “fair share” in achieving the identified GHG reduction targets.



Source: County of Napa

Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>GHG Reduction Measures</b>								
<b>Agriculture - Primary Measures</b>								
AG-1	Support the conversion of stationary diesel or gas-powered irrigation pumps to electric pumps	Planning & BAAQMD	Near-Term	Low	Less than 0.01 FTE	Yes <sup>2</sup>	Financing & Incentives	Requires County staff time for development review, funding sources for new incentives, and collaboration with BAAQMD. New or replacement equipment costs and potential electrification costs for property owners, with potential for long-term cost savings.
AG-2	Support use of electric or alternatively-fueled agricultural equipment	Planning & BAAQMD	Near-Term	Low	Less than 0.01 FTE	Yes <sup>2</sup>	Partnerships	Requires County staff time for development review and collaboration with BAAQMD and agricultural sector. New or replacement equipment costs for property owners, with potential for long-term cost savings.
AG-3	Support the use of Tier 4 final diesel equipment for off-road agricultural equipment	Planning & Agricultural Community	Mid-Term	Low	Less than 0.01 FTE	Yes <sup>2</sup>	Partnerships	Requires County staff time for development review and collaboration with agriculture sector. New or replacement equipment costs for property owners, with potential for long-term cost savings.
AG-4	Support reduced application of inorganic nitrogen fertilizer	Planning & Agricultural Community	Near-Term	Low	0.02 FTE	No	Partnerships, Education & Outreach	Requires County staff collaboration with agriculture sector. Potential cost savings for farmers from reduced fertilizer use.
<b>Agriculture - Secondary Measures</b>								
AG-5	Support BAAQMD in efforts to reduce open burning of removed agricultural biomass and flood debris	Planning & BAAQMD	Near-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time for collaboration with BAAQMD.
AG-6	Encourage and support the use of carbon farming and other sustainable agricultural practices in the County	Planning, Napa County RCD, & Agricultural Community	Mid-Term	Low	Less than 0.01 FTE	Yes <sup>2</sup>	Partnerships, Program Research & Development, Education & Outreach	Requires County staff time for collaboration. New funding sources could be required to provide incentives or expand existing programs operated by RCD or other organizations.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>Building Energy- Primary Measures</b>								
BE-1	Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for eligible alterations or additions to existing buildings	Building & Public Works	Near-Term	Medium	0.08 FTE	Yes	Code Updates, Financing & Incentives	Requires County staff time to update and enforce new CALGreen Tier 1 building code requirements, and develop incentives to help offset permit and construction costs. Upgraded green building and sustainable site design measures could increase development costs, but also would reduce operating costs for future residents and businesses.
BE-2	Require compliance with CALGreen Tier 1 Green Building standards and Tier 1 Building Energy Efficiency Standards for all new construction, and phase in ZNE standards for new construction, beginning with residential in 2020 and non-residential by 2030	Building & Public Works	Near-Term	Medium	0.08 FTE	Yes	Code Updates, Financing & Incentives	Requires County staff time to update and enforce new CALGreen Tier 1 and ZNE code requirements and develop incentives to help offset permit and construction costs. Upgraded green building and sustainable site design measures could increase development costs, but also would reduce operating costs for future residents and businesses.
BE-3	Increase participation in MCE's Deep Green (100 percent renewable) option	Planning, Public Works, MCE, & Potential Funding Sources	Near-Term	Medium	Less than 0.01 FTE	No	Financing & Incentives	Requires County staff time to develop incentive program, along with a potential new funding source to provide subsidy to income-qualified residents to offset cost of MCE Deep Green premium.
BE-4	Require new or replacement residential and commercial water heating systems to be electrically powered and/or alternatively fueled (e.g., solar water heating) for all residential land uses	Building	Near-Term	Medium	0.08 FTE	Yes	Code Updates, Financing & Incentives	Requires County staff time to update and enforce new regulations in County building code, and develop incentives to help offset permit and construction costs. New or replacement could reduce operating costs for residents due to increased efficiency.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
BE-5	Expand current renewable energy and green energy incentives and update local ordinances	Planning, Google, and National Renewable Energy Laboratory	Mid-Term	Medium	0.08 FTE	No	Code Updates, Financing & Incentives, Partnerships	Requires County staff time to update local ordinances and expand incentive programs. Annual costs to County for permitting or other incentives. Potential costs savings to consumers would help to offset costs of installation along with County incentives.
BE-6	Select MCE's Deep Green option for all County facilities	Public Works	Near-Term	Low	0.000 FTE	No	Financing & Incentives	Annual County operating cost increases for MCE Deep Green premium.
BE-7	Support waste-to-energy programs at unincorporated landfills	Planning, Public Works, & Landfills	Mid-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to collaborate with other agencies and organizations. New infrastructure costs, and operating costs and benefits, need to be determined based on specific programs or projects.
<b>Building Energy- Secondary Measures</b>								
BE-8	Work with PG&E, BayREN, MCE, and PACE financing programs, and other regional partners to incentivize energy efficiency improvements in existing buildings	Planning, Public Works, BayREN, MCE, & PG&E	Ongoing, Near-Term	Medium	0.02 FTE	No	Partnerships, Financing & Incentives	Requires County staff time to maintain and provide information to the public regarding existing incentive and financing programs, and collaborate with existing organizations and partnerships.
BE-9	Require energy audits for major additions to or alterations of existing buildings	Building	Near-Term	Medium	0.08 FTE	Yes	Code Updates	Requires County staff time to update and enforce new regulations in County building code. Upgraded homes or existing buildings would help to reduce operating costs for residents and businesses.
BE-10	Develop a program to allow new development to offset project GHG emissions by retrofitting existing income-qualified homes and buildings	Planning	Mid-Term	Medium	0.12 FTE	No	Program Research & Development	Requires County staff time to research, develop, and adopt a new GHG offset program.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
BE-11	Encourage solar panel installations on commercial roof spaces	Planning & MCE	Near-Term	Medium	Less than 0.01 FTE	No	Partnerships, Financing & Incentives	Requires County staff time to collaborate with MCE and develop incentive programs.
<b>Land Use – Primary Measures</b>								
LU-1	Establish targets and enhanced programs for oak woodland and coniferous forest preservation and mandatory replanting	Planning, Project Applicants, & Volunteers	Near-Term	Medium	0.15 FTE	Yes	Code Updates, Partnerships, Financing & Incentives	Requires County staff time to update and enforce new code provisions, develop mitigation program, and collaborate with other agencies or organizations to identify funding and appropriate replanting sites.
LU-2	Refine protection guidelines for existing riparian lands	Planning	Near-Term	Medium	0.15 FTE	Yes	Code Updates, Partnerships	Requires County staff time to update code & guidelines, and work with arborists and local organizations.
LU-3	Repurpose or otherwise prevent burning of removed trees and other woody material from land use conversions of oak woodlands and coniferous forests	Planning & Eligible Businesses/ Organizations	Near-Term	Medium	0.02 FTE	Yes	Program Research & Development, Partnerships	Requires County staff time to develop and implement a new program and establish partnerships with local businesses. Potential cost increases associated with harvesting of removed timber or woody biomass could be offset by the sale of wood products.
<b>Multi-Sector – Primary Measures</b>								
MS-1	Support efforts to increase Napa Green Certified wineries and land in the County, with a goal of achieving a 100-percent certification rate for all eligible wineries and properties by 2030	Planning, Public Works, Napa Green, & Businesses	Near-Term	Medium	0.12 FTE	No	Program Research & Development, Partnerships	Requires County staff time to work collaboratively with the Napa Green program.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>Multi-Sector – Secondary Measures</b>								
MS-2	Work with other local jurisdictions within the County to develop a unified Climate Action Plan	Planning & Other Cities	Mid-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to collaborate with local jurisdictions
MS-3	Promote the sale and consumption of locally-grown foods and/or products	Planning & the Agriculture Commissioner's Office	Mid-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with local businesses and organizations.
MS-4	Establish a local carbon offset program in partnership with Sustainable Napa County	Planning & Sustainable Napa County	Mid-Term	High	0.23 FTE	No	Program Research & Development, Partnerships	Requires County staff time to work collaboratively with local organizations to develop and implement a new program.
<b>Off-Road Vehicles and Equipment – Primary Measures</b>								
OR-1	Require Tier 4 equipment for all construction activity and mining operations as a condition for approval by 2030	Planning & Project Applicants	Mid-Term	Medium	0.08 FTE	No	Code Updates	Requires staff time to develop, adopt and enforce County code amendments. Potential cost increases associated with new or modified equipment could potentially be offset by increased efficiency.
OR-2	Promote use of alternative fuels for recreational marine vessels	Planning, Dock Operators, Local Businesses, & Cities	Near-Term	Medium	0.02 FTE	No	Program Research & Development, Partnerships	Requires County staff time to develop program in collaboration with existing dock operators, local agencies, and the boating industry.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>Solid Waste – Primary Measures</b>								
SW-1	Encourage expansion of composting program for both residential and commercial land uses	Planning & Waste Management Companies	Near-Term	Medium	0.12 FTE	Yes	Program Research & Development, Partnerships	Requires County staff time to work collaboratively with waste haulers and waste management agencies on program expansion.
SW-2	Meet an 80 percent Waste Diversion Goal by 2020 and a 90 percent Waste Diversion Goal by 2030	Planning & Waste Management Companies	Near-Term	Medium	0.12 FTE	No	Program Research & Development, Partnerships	Requires County staff time to work collaboratively with waste haulers and waste management agencies to adopt and implement new waste diversion goals.
<b>On-Road Transportation – Primary Measures</b>								
TR-1	Update Transportation System Management Ordinance (for employers)	Planning, BAAQMD, & MTC	Near-Term	Medium	0.23 FTE	Yes	Code Updates	Requires County staff time to develop, update, and enforce an existing ordinance, collaborate with regional and local agencies, and secure new funding.
TR-2	Adopt parking reduction ordinance revisions	Planning	Near-Term	Medium	0.23 FTE	Yes	Code Updates	Requires County staff time to research, develop and update parking standards in the County code.
TR-3	Increase affordable housing, especially workforce housing, in Napa County	Planning, Cities, Napa County Housing Authority & NVTA	Mid-Term	Medium	0.12 FTE	No	Program Research & Development, Partnerships	Requires County staff time to develop or implement affordable housing programs, and collaborate with regional partners on regional affordable housing efforts.
TR-4	Support efforts to allow commuter service to operate on railroad rights-of-way	Planning, NVTA, & Napa Wine Train	Mid-Term	High	Less than 0.01 FTE	No	Program Research & Development, Partnerships	Requires County staff time to research and develop potential new services, in collaboration with local and regional agencies such as NVTA. New funding sources could be required for capital and operations & maintenance.
TR-5	Support efforts of solid waste collection services to convert diesel solid waste collection vehicles to use compressed natural gas	Planning & Solid Waste Collection Services	By 2030	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with waste haulers and waste management agencies on program expansion.

Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>On-Road Transportation – Supporting Measures</b>								
TR-6	Support efforts of transit agencies to increase availability and accessibility of transit information	Planning, NVTA, & Regional Transit Agencies	Near-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with NVTA and transit agencies
TR-7	Support alternatives to private vehicle travel for visitors	Planning, NVTA, & Visit Napa Valley	Mid-Term	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with NVTA and Visit Napa Valley
TR-8	Support Napa County's incorporated cities in developing transit-oriented development unique to the needs of the Napa Region	Planning & Cities	Mid-Term	Medium	0.12 FTE	No	Program Research & Development	Requires County staff time to work collaboratively with local incorporated communities
TR-9	Support interregional transit solutions	Planning, Cities, NVTA, MTC, & Regional Transit Agencies	By 2030	Low	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with local incorporated communities, NVTA, and regional transit agencies
TR-10	Work with Napa County's incorporated cities, NVTA, and neighboring regions to increase presence of park and ride facilities near residential centers	Planning, Cities, & NVTA	By 2030	Medium	Less than 0.01 FTE	No	Partnerships	Requires County staff time to work collaboratively with local incorporated communities, NVTA
TR-11	Promote existing ride-matching services for people living and working in the unincorporated county	Planning, NVTA, Solano Transportation Authority	By 2030	Low	0.02 FTE	No	Partnerships, Education & Outreach	Requires County staff time to work collaboratively with NVTA and Solano Transportation Authority



**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
TR-12	Increase the supply of electric vehicle charging stations	Planning, Public Works & Local Businesses	By 2030	Low	0.02 FTE	Yes	Financing & Incentives	Requires County staff time to promote programs, identify funding for capital costs and maintenance, and review development projects
TR-13	Promote telecommuting at office-based businesses	Planning	By 2030	Low	0.02 FTE	No	Partnerships, Education & Outreach	Requires County staff time to work collaboratively with local businesses and organizations
TR-14	Develop and implement active transportation projects	Planning, Public Health, Napa Valley Vine Trail Coalition, NVTA, & Caltrans	Mid-Term	Medium	Less than 0.01 FTE	No	Partnerships, Financing & Incentives	Requires County staff collaboration with NVTA and other organizations, and agencies to develop and implement projects. Existing statewide funding sources are available, however additional funding sources could also be needed.
TR-15	Require new development projects to evaluate and reduce VMT	Planning	Near-Term	Medium	0.12 FTE	Yes	Program Research & Development	Requires County staff time to further develop VMT analysis thresholds and guidance per the Circulation Element Update, and review development projects for consistency.
<b>Water and Wastewater – Supporting Measures</b>								
WA-1	Amend or revise water conservation regulations for landscape design	Planning	Near-Term	Low	0.08 FTE	Yes	Code Updates	Requires County staff time to review, update and enforce water conservation regulations in the County Code.
WA-2	Adopt a new water conservation ordinance for commercial and residential land uses limiting outdoor watering	Planning	Near-Term	Low	0.08 FTE	No	Code Updates	Requires County staff time to review, update and enforce water conservation regulations in the County Code.
WA-3	Expedite and/or reduce permit fees associated with water conservation installations in existing facilities	Planning	Near-Term	Low	0.02 FTE	No	Financing & Incentives	Requires County staff time to develop and implement a permitting streamlining or incentive program

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
WA-4	Require water audits for large new commercial or industrial projects and significant expansions of existing facilities	Planning	Mid-Term	Medium	0.02 FTE	Yes	Program Research & Development	Requires County staff time to review, update and enforce new water audit requirements in the County Code.
<b>High GWP Gases – Supporting Measures</b>								
HG-1	Encourage registration of facilities in CARB's RMP and incentivize installation of low-GWP refrigerant systems	Planning & Building	Mid-Term	Medium	0.02 FTE	No	Partnerships, Education & Outreach, Program Research & Development	Requires County staff time to promote existing State programs and explore new incentive programs.
HG-2	Incentivize the use of low-GWP refrigerants	Planning & Building	Mid-Term	Medium	0.02 FTE	Yes	Partnerships, Education & Outreach, Research & Development	Requires County staff time to review development projects and explore new incentive programs.
<b>Adaptation Measures</b>								
<b>Temperature</b>								
Temp-1	Map Critical Infrastructure Locations Vulnerable to Extreme Heat Events	Planning & Public Works	Near-Term	Medium	0.06 FTE	N/A	Program Research & Development	Requires County staff time to develop a process for mapping infrastructure that is vulnerable and to work collaboratively across County departments. Potential funding may be needed to implement the work.
Temp-2	Develop Outreach Programs for Outdoor Workers	Planning & Public Health Division	Near-Term	Medium	0.02 FTE	N/A	Education & Outreach	Requires County staff time to research, develop, and create outreach programs, and to collaborate with labor organizations, the agriculture and wine community, and County and State health and safety agencies.
Temp-3	Educate Residents on Heat-Related Illness Prevention	Planning & Public Health Division	Near-Term	Low	0.02 FTE	N/A	Education & Outreach	Requires County staff time to develop and publicize methods for preventing heat-related illness during heatwaves.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
Temp-4	Encourage the installation of Cool Roof Technologies and Rooftop Gardens	Planning	Near-Term	Medium	0.08 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to develop an incentive program for cool roof and rooftop gardens. Annual costs to County for permitting or other incentives, but potential cost savings to consumers.
Temp-5	Incorporate Cool Pavement Technology	Planning & Public Works	Mid-Term	Medium	0.08 FTE	N/A	Program Research & Development	Requires County staff time to research and develop methods for incorporating cool pavement technology into maintenance and construction of new roads, sidewalks, parking areas, and bike lanes, and to secure new sources of funding.
Temp-6	Improve Parking Lot Shading and Landscaping	Planning	Near-Term	Low	0.02 FTE	N/A	Program Research & Development, Code Updates, Education & Outreach	Requires County staff time to develop policies to improve parking lot shading requirements in new construction, and to develop outreach program for promoting planting of additional trees/landscaping in existing parking lots.
Temp-7	Update the County's Excessive Heat Emergency Response Plan	Planning & Public Health Division	Near-Term	Medium	0.12 FTE	N/A	Financing & Incentives	Requires County staff time to prepare an updated plan and to work collaboratively across County departments. Funding sources may be needed to support the update of this plan.
Temp-8	Support Research on the Effects of a Warmer Climate on the Agriculture and Wine Industries	Planning & the Agriculture Commissioner's Office	Near-Term	Low	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to collaborate with existing organizations and groups, including the Napa Valley Vintners and the California Climate and Agriculture Network.
Temp-9	Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Temperatures	Planning & the Agriculture Commissioner's Office	Mid-Term	Low	0.03 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to collaborate with grape growers and to research and explore options to shift the types of grape varieties to suit changing environment. Funding sources may be needed to begin research.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
Temp-10	Develop Outreach Programs for Winemakers	Planning & the Agriculture Commissioner's Office	Mid-Term	Low	0.03 FTE	N/A	Education & Outreach	Requires County staff time to develop and prepare outreach programs to inform and assist winemakers, and work collaboratively with the Agriculture Commissioner's Office.
Temp-11	Develop Strategies to Increase Energy Resiliency	Planning, Public Works, MCE, & PG&E	Mid-Term	Medium	Less than 0.01 FTE	N/A	Program Research & Development, Partnerships	Requires County staff time to develop and implement strategies, and work collaboratively with MCE and PG&E to increase energy resiliency in extreme events.
<b>Wildfire Risk</b>								
Fire-1	Map and Identify Locations That Are Newly at Risk, or at Higher Risk for Fire Hazards	Planning, Napa County Fire Department, & CAL FIRE	Near-Term	Medium	0.06 FTE	N/A	Program Research & Development, Partnerships	Requires County staff time to work collaboratively with CAL FIRE and the Napa County Fire Department to identify locations newly or at higher risk for fire hazards.
Fire-2	Map Critical Infrastructure Locations Vulnerable to Wildfires	Planning, Public Works, & Caltrans	Near-Term	Medium	0.06 FTE	N/A	Program Research & Development	Requires County staff time to develop a process for mapping infrastructure that is vulnerable and to work collaboratively across County departments. Potential funding may be needed to implement the work.
Fire-3	Collaborate with the Napa County Firefighters Association in the Dissemination of Information	Planning & Napa County Firefighters Association	Mid-Term	Low	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to work collaboratively with the Napa County Firefighters Association.
Fire-4	Coordinate Emergency Preparedness Systems	Planning, Public Health, Napa County Firefighters Association, & Office of Emergency Services	Mid-Term	Low	0.01 FTE	N/A	Partnerships	Requires County staff time to work collaboratively with the Napa County Firefighters Association and the Office of Emergency Services.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
Fire-5	Collaborate on Programs to Reduce Fire Hazards	Planning & Napa County Fire Department	Near-Term	Low	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to collaborate with the Napa County Fire Department to reduce fire hazards through continued programming.
<b>Water Supply and Quality</b>								
Water-1	Evaluate Vulnerabilities of Water Supply Systems and Networks	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Near-Term	Medium	0.12 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to research and develop methodologies for evaluating the water supply system and network vulnerabilities. Potential funding may be needed to begin research.
Water-2	Consider Innovative Options to Meet Future Demand	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Mid-Term	Medium	0.12 FTE	N/A	Program Research & Development	Requires County staff time to research, secure funding, and develop programs, and to work collaboratively with the Napa County Flood Control and Water Conservation District and across County departments.
Water-3	Promote Use of Rainwater Catchment Systems	Planning & Public Works	Mid-Term	Low	Less than 0.01 FTE	N/A	Partnerships, Outreach & Education	Requires County staff time to work collaboratively across County departments.
Water-4	Support Napa Green Land Efforts	Planning	Near-Term	Low	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to collaborate and support Napa Green Land.
Water-5	Collaborate with Agencies to Identify Future Water Supplies and Explore Alternative Supply Sources	Planning, Napa County Flood Control & Water Conservation District, & Public Works	Mid-Term	Medium	0.12 FTE	N/A	Partnerships, Program Research & Development	Requires County staff time to collaborate with Napa County Flood Control and Water Conservation District and Public Works, and time to develop and research opportunities to explore alternative water supply sources. Funding may be needed to begin research.
Water-6	Pursue Grant Funding Opportunities for Water Resource Planning Projects	Planning & Public Works	Mid-Term	Low	0.12 FTE	N/A	Financing & Incentives	Requires County staff time to identify and pursue grant funding opportunities for water resource planning projects.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>Flood Risk (Adaptation)</b>								
Flood-1	Update the County's Operational Area Hazard Mitigation Plan to Address Flooding and Climate Change	Planning, Public Health, & Office of Emergency Services	Near-Term	Medium	0.15 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to prepare an updated plan and to work collaboratively across County departments. Funding sources may be needed to support the update of this plan.
Flood-2	Partner with Incorporated Towns and Cities and Local Organizations to Address Flooding	Planning, Napa County Flood Control and Water Conservation District, & Incorporated Cities <sup>1</sup>	Mid-Term	Medium	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to coordinate efforts and work collaboratively with incorporated cities in the County and local organizations to address flooding.
Flood-3	Identify Potential Streamside Restoration Areas	Planning & Public Works	Near-Term	Low	0.02 FTE	N/A	Program Research & Development	Requires County staff time to research and identify streamside area locations that could be restored.
Flood-4	Encourage the Replanting of Bare or Disturbed Areas	Planning & Public Works	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development	Requires County staff time to develop, secure funding, and implement a program to replant bare or disturbed areas.
Flood-5	Coordinate Emergency Evacuation and Supply Transportation Routes	Planning & Office of Emergency Services	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development, Partnerships	Requires County staff time to coordinate with the Office of Emergency Services on emergency evacuation and supply transportation routes to ensure capacity and resilience.
Flood-6	Improve Sewage and Solid-Waste Management Infrastructure	Planning & Public Works	Mid-Term	High	0.04 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to research, develop, and implement programs to improve sewage and solid-waste management infrastructure, and to work collaboratively across County departments. Funding sources may be needed to support implementation.

**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
Flood-7	Improve Capacity of Storm Water Infrastructure	Planning & Public Works	Mid-Term	High	0.04 FTE	N/A	Program Research & Development	Requires County staff time to research, evaluate, and implement programs to improve the capacity of storm water infrastructure for high intensity rainfall events. Funding sources may be needed to support implementation.
Flood-8	Increase Use of Pervious Surfaces and Landscaping in Developed Areas	Planning & Public Works	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development, Education & Outreach	Requires County staff time to develop, secure funding, implement, and promote programs to increase the use of pervious surfaces and landscaping.
Flood-9	Map Critical Infrastructure Locations Vulnerable to Flooding	Planning, Napa County Flood Control and Water Conservation District, & NVTA	Near-Term	Medium	0.06 FTE	N/A	Program Research & Development	Requires County staff time to develop a process for mapping infrastructure that is vulnerable and to work collaboratively across County departments, Napa County Flood Control and Water Conservation District, and NVTA. Potential funding may be needed to implement the work.
Flood-10	Understand the Tolerance of Current Wine Grape Varieties to Withstand Increased Flooding	Planning & the Agriculture Commissioner's Office	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to collaborate with the agriculture sector and to research and explore options to shift the types of grape varieties to suit changing environment. Funding sources may be needed to begin research.
Flood-11	Design Programs to Address Vector- and Waterborne Diseases	Planning and Public Health Division	Near-Term	Low	0.04 FTE	N/A	Program Research & Development	Requires County staff time to research, develop, coordinate, and implement programs to monitor and prepare for the appearance of vector- and waterborne diseases following floods and storms.

Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
<b>Sea-Level Rise</b>								
SLR-1	Identify Areas Affected by Sea-Level Rise	Planning	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development	Requires County staff to research, identify, and assess areas that will be affected by sea-level rise, and to establish policies and programs to protect functions, structures, and populations.
SLR-2	Update Napa County's Operational Area Hazard Mitigation Plan to Incorporate Sea-Level Rise	Planning & Office of Emergency Services	Near-Term	Medium	0.15 FTE	N/A	Program Research & Development, Financing & Incentives	Requires County staff time to prepare an updated plan and to work collaboratively across County departments. Funding sources may be needed to support the update of this plan.
SLR-3	Floodplain Mapping Coordination	Planning, Napa County Flood Control and Water Conservation District, FEMA, DWR, & NVTA	Near-Term	Medium	Less than 0.01 FTE	N/A	Program Research & Development	Requires County staff time to coordinate and collaborate with FEMA, DWR, and Napa County Flood Control and Water Conservation on updating floodplain mapping regularly.
SLR-4	Support Ongoing Analysis of Sea-Level Rise Data	Planning	Near-Term	Low	Less than 0.01 FTE	N/A	Partnerships	Requires County staff time to support FEMA, the Bay Conservation Development Commission, the Bay Area Regional Collaborative, and National Oceanic and Atmospheric Administration in ongoing collection and analysis of sea-level rise data.
SLR-5	Create a Comprehensive Outreach Strategy	Planning	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development, Education & Outreach	Requires County staff time to research, design, implement, educate, and promote a comprehensive outreach strategy to protect and increase community resiliency to sea-level rise.
SLR-6	Incorporate Sea-Level Rise Effects into Capital Improvement Plans	Planning & Public Works	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development	Requires County staff time to prepare and incorporate sea-level rise into Capital Improvement Plans and to work collaboratively across County departments.



**Table 5-1 Napa County CAP Implementation Assumptions for GHG Reduction and Adaptation Measures**

Measure #	Title	Responsibility	Timeframe <sup>1</sup>	General County Implementation Costs	Estimated County Staff Time	Applies to Projects Seeking CEQA GHG Streamlining	Category	Implementing Actions and Other Considerations
SLR-7	Assess Sea-Level Rise Impacts on Agriculture	Planning	Mid-Term	Medium	0.04 FTE	N/A	Program Research & Development	Requires County staff time to research, identify, and assess the impacts of sea-level rise on the County's agriculture sector. Funding sources may be needed to support research.

## Notes:

<sup>1</sup> Near-Term = 1-3 Years, Mid-Term = 4-7 Years

<sup>2</sup> These measures only apply to new vineyards on more than 5% slope. See Appendix D for the Checklist and additional details.

BAAQMD = Bay Area Air Quality Management District, BAU = Business-As-Usual, CAL FIRE = California Department of Forestry and Fire Protection, CALGreen = California Green Building Standards Code, CAP = Climate Action Plan, CARB = California Air Resources Board, CEQA = California Environmental Quality Act, DWR = Department of Water Resources, FEMA = Federal Emergency Management Agency, FTE = full-time equivalent, GHG = greenhouse gas emissions, MCE = Marin Clean Energy, MTC = Metropolitan Transportation Commission, MTCO<sub>2e</sub> = metric tons of carbon dioxide equivalent, N/A = Not Applicable, NVTA = Napa Valley Transportation Authority, PACE = property assessed clean energy, PG&E = Pacific Gas and Electric, RCD = Resource Conservation District, RMP = Refrigerant Management Program, VMT = vehicle miles traveled, ZNE = zero net energy

Source: Ascent Environmental 2018

## 5.3 Monitoring and Updates

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

Upon adoption in 2019, the specific measures and actions identified as near-term priorities will begin to be implemented by the County. To track progress, County staff will coordinate updates to the inventory every five years beginning with the year 2020. This will help ensure progress is being made towards achieving emission reduction targets.

In addition to updating the County's emissions inventory, County staff will also evaluate the GHG emission reduction measures' capacity, cost, effectiveness, and benefits of each individual measure. Evaluating CAP measure performance requires monitoring the level of community participation, costs, barriers to implementation, and actual reductions in fuel consumption, vehicle miles traveled, energy usage, water usage, landfilled waste, or other activities that result in GHG emissions reductions. By evaluating whether the implementation of a measure is on track to achieve its reduction potential, the County can identify successful measures and reevaluate or replace under-performing ones.

Beginning in 2020, County staff will evaluate measures every two years and will summarize progress toward meeting the GHG reduction target at that time in a report to the Board of Supervisors. Additionally, beginning in 2022 and every five years after, County staff will prepare a more detailed report on the CAP to the Board that describes:

- results of the latest five-year update to the inventory;
- estimated annual GHG reductions associated with measure implementation or legislative reductions;
- participation rates (where applicable);
- implementation costs and funding needs;
- community benefits realized;
- remaining barriers to implementation; and
- recommendations for changes to the CAP.

Additionally, the County will prepare a Target Year Report in 2027 for the Board of Supervisors. This report will present the most current inventory, status of measures, and will summarize achievements to

Beginning with the year 2020, the County will:

- evaluate measure performance every two years,
- coordinate inventory updates every five years, and
- evaluate and summarize measures in a detailed report to the Board of Supervisors every five years.

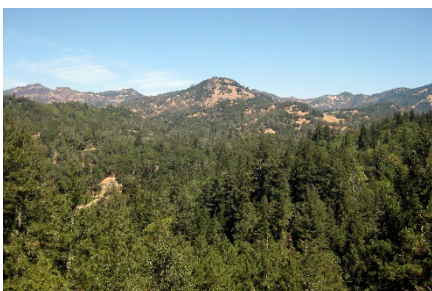
CEQA Guidelines Section 15183.5(b)(1)(E) requires that the County amend the CAP if it finds that the plan is not achieving the adopted GHG reduction targets.

date and demonstrate progress towards achieving the 2030 and 2050 targets. The report will also provide recommendations for any changes needed to the CAP to ensure that targets are met in 2030. Figure 5-1 below outlines the CAP monitoring schedule.

CAP Monitoring Schedule	
2019	<b>CAP Adopted</b> Board of Supervisors adopts plan and staff begins to implement CAP measures.
2020	<b>Measure Status Review</b> County staff reviews measure performance and implementation status, and prepares report for presentation to the Board.
2022	<b>Inventory Update / Measure Status Review / CAP Report</b> County staff report to the Board of Supervisors on the 2020 inventory update results, measure performance and implementation status, key achievements to date (i.e., status of meeting 2020 targets), and recommended changes to the CAP if measures prove infeasible. The report also will identify ways to adapt the plan to maintain the desired reduction path.
2024,2026	<b>Measure Status Reviews</b> County staff reviews measure performance and implementation status, and prepares report for presentation to the Board.
2027	<b>Inventory Update / Target Year Report</b> County staff reports on results of the 2025 inventory update and develops Target Year Report for presentation to Board that summarizes achievements to date and provides recommended changes to the CAP to stay on track in meeting 2030 targets.
2030+	Repeat above process and develop appropriate actions to meet 2050 GHG reduction goals.

Figure 5-1. CAP Monitoring Schedule

## 5.4 Ongoing Community Engagement and Participation



Source: County of Napa

As the County continues to implement and monitor progress on the CAP, continued engagement with and participation by the community is critical. This includes individual residents and businesses, community organizations (e.g., Napa Valley Vintners, Napa Valley Grapegrowers, Sustainable Napa County), local and regional government agencies, and others. It is important to engage disadvantaged communities, who are the most vulnerable to and least able to adapt to the impacts of climate change. While this CAP focuses on measures in which the County has a role, many of the measures require partnership and collaboration.

The County is also committed to public education about the important role individuals play in combating climate change. Effective and long term climate action and resiliency in the County can only be achieved through efforts that continue to change the way individuals interact with the environment. Many of the measures in Chapters 3 and 4 are focused on increasing community awareness and participation in existing programs, or connecting the community with new information, tools, funding or resources to take action. Thus, this CAP serves as a resource that supports community-based action.

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Napa County Climate Action Plan



A Tradition of Stewardship  
A Commitment to Service

## Chapter 6

# References



## Executive Summary

None present.

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## Chapter 5, Implementation and Monitoring

*None present.*

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