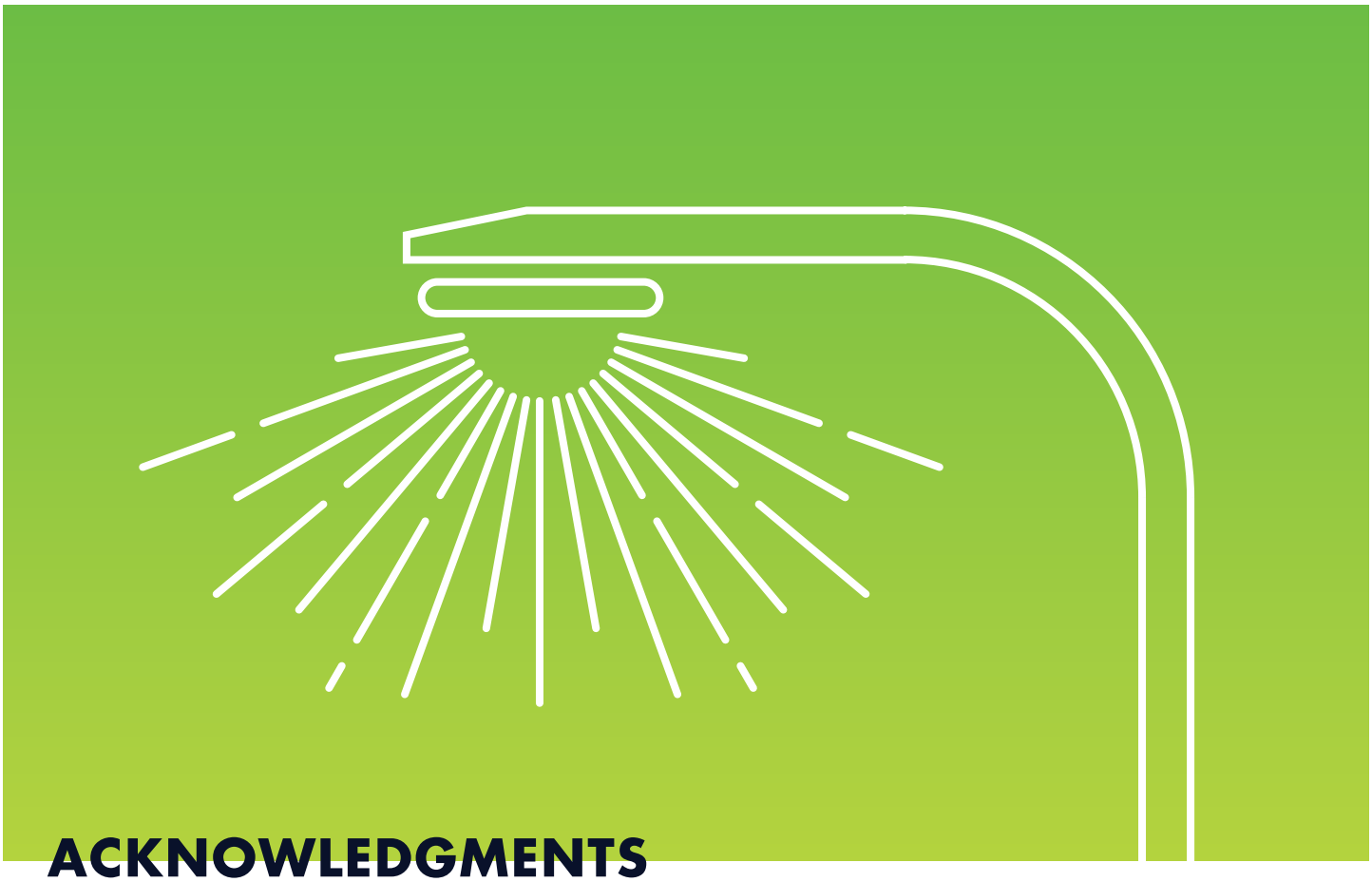
TOWN OF *Yountville*

CLIMATE ACTION PLAN

SEPTEMBER 2016



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"WE ARE THE FIRST GENERATION TO FEEL THE EFFECT OF CLIMATE CHANGE AND THE LAST GENERATION WHO CAN DO SOMETHING ABOUT IT."

- BARACK OBAMA

PRESIDENT OF THE UNITED STATES

INTRODUCTION

Purpose of the Climate Action Plan

The Town of Yountville understands that climate change has the potential to significantly affect Yountville's residents and businesses, as well as other communities around the world. The Town also recognizes that local governments play a strong role in reducing greenhouse gas emissions and mitigating the potential impacts of climate change.

The purpose of this Climate Action Plan (CAP) is to compile existing and potential strategies (i.e., actions, projects, and programs) that the Town's government and the community can use to address climate change. It provides a brief background on what climate change is and its potential impacts, but focuses on the efforts Yountville can take to reduce its greenhouse gas emissions and mitigate, to the extent feasible at the local level, the potential impacts of climate change.

Through the actions outlined in this plan, such as increasing energy efficiency in buildings, encouraging less dependence on the automobile, and using clean, renewable energy sources, the Yountville community can experience lower energy bills, improved air quality, reduced emissions, and an enhanced quality of life. The Town's preparation of the 2010 Greenhouse Gas Emissions Inventory and this Climate Action Plan is the foundation of an ongoing planning process that includes assessing, planning, mitigating and adapting to climate change.

Specifically, this plan does the following:

- Summarizes the various regulations at the federal, state, and regional levels.
- Incorporates the Town's 2010 Greenhouse Gas Emission Inventory, which identified sources of greenhouse gas emissions generated by the community and the local government.
- Estimates how these emissions may change over time under a business-as-usual forecast.
- Provides energy use, transportation, water, wastewater, waste and natural system strategies necessary to minimize Yountville's impacts on climate change.

Relationship to the General Plan

The Town of Yountville's General Plan, adopted in 1992, contains policies and programs in the plan's Conservation element that promote community sustainability and effective management of renewable and non-renewable natural resources through energy and water conservation, and solid waste reduction and recycling. The Circulation Element of the General Plan was updated in 2015, and specific programs from that element have been carried over to this plan in order to maintain consistency. Greenhouse gas reduction measures contained in the CAP are intended to provide the Town with information needed to prioritize and implement specific programs. Many of these programs will require additional study and analysis before implementation. Measures are advisory in nature and are not mandates. The Climate Action Plan will be incorporated into the update of the Town's General Plan, now underway.

Climate Change Background

A balance of naturally occurring gases dispersed in the atmosphere determines the Earth's climate by trapping infrared radiation (heat), a phenomenon known as the greenhouse effect (Figure 1). Significant evidence suggests that human activities are increasing the concentration of these gases (known as "greenhouse gases" or GHGs) in the atmosphere, causing a rise in global average surface temperature and consequent global climate change. The greenhouse gases include carbon dioxide, methane, nitrous oxide, and hydroflourocarbons (Table 1). Each one has a different degree of impact on climate change. To facilitate comparison across different emission sources with mixed and varied compositions of several GHGs, the term "carbon dioxide equivalent" or CO_2e is used. One metric ton of CO_2e may consist of any combination of GHGs, and has the equivalent Global Warming Potential (GWP) as one metric ton of carbon dioxide (CO2). According to the U.S. Environmental Protection Agency's (EPA)

April 2015, "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013," the majority of GHG emissions comes from fossil fuel combustion, which in turn is used for electricity, transportation, industry, heating, etc.

Figure 1: The Greenhouse Effect

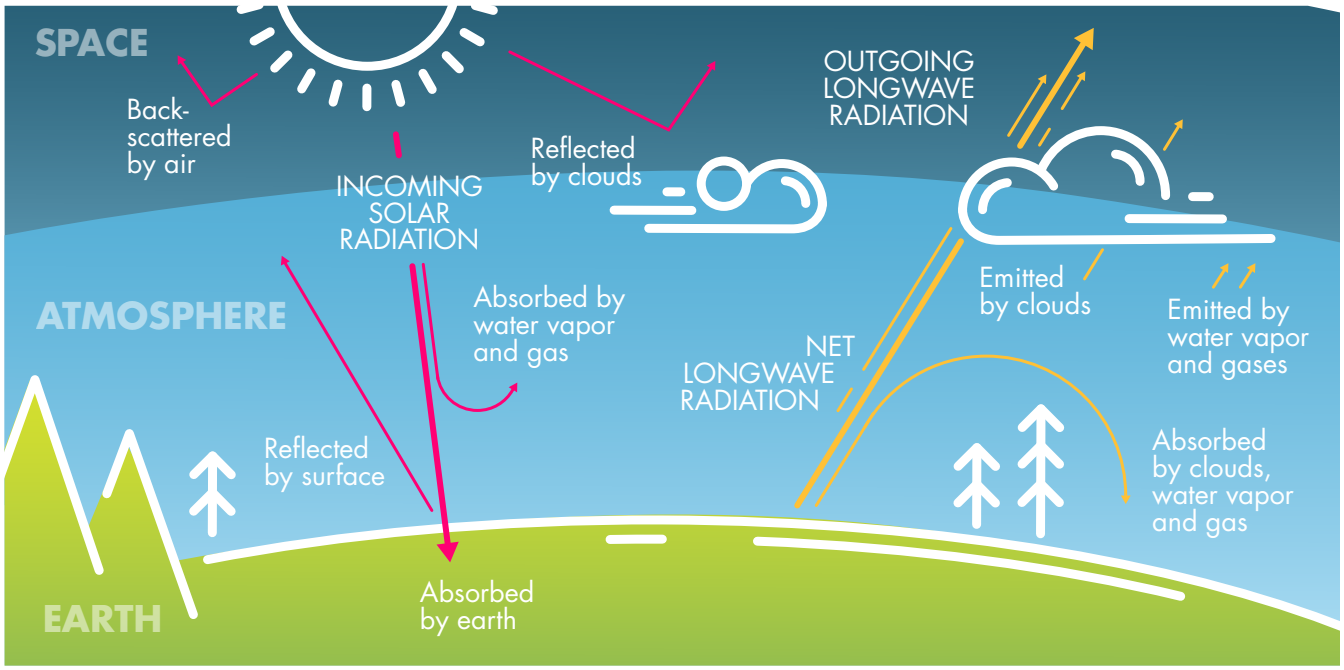


Table 1: Greenhouse Gases

GAS	CHEMICAL FORMULA	EMISSION SOURCE	GLOBAL WARMING POTENTIAL
Carbon Dioxide	CO_2	Combustion of natural gas, gasoline, diesel, and other fuels.	1
Methane	CH_4	Combustion, anaerobic decomposition of organic waste in landfills, wastewater and livestock.	21
Nitrous Oxide	N_2O	Combustion, wastewater treatment.	310
Hydroflourocarbons	Various	Leaked refrigerants, fire suppressants	12 to 11,700

Climate Change Impacts in California and the Bay Area

According to a 2006 Summary Report from the California Climate Change Center, global warming could significantly impact California water and forest resources. The Center's 2006 Summary Report noted the following findings and potential risks to California:[1]

- Precipitation is the most important hydrologic variable and most difficult to forecast.
- Warming raises the elevation of snow levels with reduced spring snowmelt and more winter runoff.
- Less snowmelt runoff means lower early summer storage at major foothill reservoirs with less hydroelectric power production.
- Higher temperatures and reduced snowmelt compounds the problem of providing suitable cold-water habitat for salmon species.
- Rising sea levels would adversely affect many coastal marshes and wildlife reserves.
- Higher temperatures increase the demand for water by plants.
- Climate change in California will result in a higher frequency of large damaging fires.
- Regional climates that are hotter and drier will result in increased pest and insect epidemics within California's forests.

Historically, air temperatures over the western United States, including California, have risen significantly over the last several decades. However, quantifying how much warming has occurred in the San Francisco Bay region is problematic due to the siting of weather stations, as many have either moved or have experienced changes in the immediate surroundings of the station.[2] Climate models predict warming, globally and

1. *California Climate Change Center, Our Changing Climate: Assessing the Risks to California, Document No.* CEC-500-2006-077, July 2006. http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF (accessed 10/13/14)

2. *California Energy Commission, Climate Change Scenarios for the San Francisco Bay Region,* July 2012, p. 4.

regionally over the San Francisco Bay, over the next century. Through the first half of this century, the models show annual temperatures rising approximately 1.5°C (2.7°F); by the end of the century, temperatures are expected to rise between 2°C to 6°C (about 3.5°F to 11°F). The models indicate there will be greater warming in the summer than in the winter in the Bay Area, and that warming becomes greater at locations that are distant from the coast. Heat waves are expected to last longer, and extreme warm temperatures will likely begin in June and could continue to occur in September.[3]

Climate change simulations indicate the San Francisco Bay region will retain its Mediterranean climate, with relatively cool and wet winters and hot dry summers. At this time, changes in precipitation are quite uncertain, although some models suggest drier conditions in the Bay Area during the middle and end of the century.[4] A 2011 study found that extreme weather events known as atmospheric rivers, which provide much of the rainfall in the region and are responsible for the largest floods, may increase both in intensity and frequency in some years.[5] The study found that as climate change proceeds, occasional atmospheric river storms may be exceptionally intense, and the season for such storms may lengthen. This suggests a potential for more frequent and more severe flooding in the region, especially when coupled with sea level rise.

Regulation of Climate Change – Federal, State and County Levels

FEDERAL CLIMATE POLICY

Currently, there is no federal legislation mandating comprehensive greenhouse gas emissions reporting or reduction in the United States. The U.S. Senate considered, but failed to pass,

3. *California Energy Commission, Climate Change Scenarios for the San Francisco Bay Region,* July 2012, pp. 4-6.

4. *California Energy Commission, Climate Change Scenarios for the San Francisco Bay Region,* July 2012, p. 8.

5. *Michael Dettinger, "Climate Change, Atmospheric Rivers, and Floods in California – A Multimodel Analysis of Storm Frequency and Magnitude Changes," Journal of the American Water Resources Association 47*(3) (June 2011):514-523.

various cap-and-trade bills in 2009 and 2010. Therefore, the U.S. has used its rulemaking authority under the Clean Air Act to begin to regulate greenhouse gas emissions. In 2009, the EPA made an "endangerment finding" that GHGs threaten the public health and welfare of the American people.[6] This finding provided the statutory prerequisite for EPA regulation of GHG emissions from motor vehicles and has led to a number of GHG regulations for stationary sources. In May 2010, the EPA issued a "tailoring" rule that enables the agency to control GHG emissions from the nation's largest GHG sources, including power plants, refineries, cement production facilities, industrial manufacturers and solid waste landfills, when these facilities are newly constructed or substantially modified. The EPA reports that its GHG permitting requirements will address 70% of the national GHG emissions from stationary sources[7]. In 2013, the EPA announced proposed Clean Air Act standards to cut carbon dioxide emissions from power plants.

In 2012, the Obama administration issued new rules that mandate an average fuel economy of 54.5 miles per gallon for cars and light-duty trucks by the 2025 model year, up from the current standard of 35.5 MPG in 2016.[8] The new standards put pressure on auto manufacturers to step up development of electric vehicles as well as improve the mileage of conventional passenger cars by producing more efficient engines and lighter car bodies. In 2011, the EPA and the Department of Transportation issued the first-ever regulations for medium and heavy-duty trucks, busses and vans, covering years 2014 through 2018.[9] The new standards require a fuel consumption reduction of 10 to 20 percent by model year 2018, depending upon the type of truck.

In 2013, President Barack Obama released his administration's Climate Action Plan which outlines steps the adminis-

6. *Final Rule, EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under the Clean Air Act, 74 Fed. Reg. 66495,* December 7, 2009, accessed 12/09/2010.

7. *Final Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule Fact Sheet,* EPA, http://www.epa.gov/NSR/documents/20100413fs.pdf, accessed 07/01/2013.

8. *"Obama Administration Finalizes Historic 54.5 MPG Fuel Efficiency Standards," Office of the Press Secretary, the White House,* http://www.whitehouse.gov/the-press-office/2012/08/28/obama-administration-finalizes-historic-545-mpg-fuel-efficiency-standard (accessed 10/07/14).

tration can take to reduce GHG emissions. Actions include: reducing emissions from power plants; accelerating renewable energy production on public lands; expanding and modernizing the electric grid; raising fuel economy standards for passenger vehicles; and accelerating energy efficiency initiatives.

STATE CLIMATE POLICY

Since 2005, the State of California has responded to growing concerns over the effects of climate change by adopting a comprehensive approach to addressing greenhouse gas (GHG) emissions in the public and private sectors. Executive Order S-3-05, signed by Governor Arnold Schwarzenegger in 2005, established long-term targets to reduce GHG emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. The 2020 GHG reduction target was subsequently codified with the passage of the Global Warming Solutions Act of 2006, more commonly known as AB 32. In 2015, Governor Jerry Brown issued Executive Order B-30-15, establishing an interim GHG reduction target of 40 percent below 1990 levels by 2030. In September 2016, the State passed legislation (SB 32) to enforce the 2030 target.

The California Air Resources Board (CARB) is responsible for monitoring and reducing greenhouse gas emissions set forth in AB 32, and is, therefore, coordinating statewide efforts. In December 2008, CARB adopted a Scoping Plan that outlines the actions required for California to reach its 2020 emission target. The actions include a broad set of programs, including higher fuel-efficiency standards for light trucks and passenger vehicles, mandates for generation of electricity from renewable sources, higher energy efficiency standards for new buildings, and incentives for solar energy installation. These programs are detailed later in this plan.

The Scoping Plan encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas

9. *U.S. Environmental Protection Agency, "Factsheet: Paving the Way Toward Cleaner, More Efficient Trucks,"* August 9, 2011.

emissions to 1990 levels by 2020. The State encourages, but does not require, local governments to track GHG emissions and adopt a Climate Action Plan that identifies how the local community will meet the reduction target. Yountville has inventoried both community and government operations GHG emissions for the baseline year 2010.

SB 375, passed by the State Assembly and Senate in August 2008, is another significant component of California's commitment to GHG reduction. The goal of SB 375 is to reduce emissions from cars and light trucks by promoting compact mixed-use, commercial and residential development. The first step outlined in SB 375 called for the state's 18 metropolitan planning organizations (MPOs) and the California Air Quality Board to establish a region's GHG reduction target for passenger vehicle and light duty truck emissions. Then, the MPO was required to develop a sustainable communities strategy that demonstrates how the region will meet its GHG reduction target. Here in the Bay Area, four regional government agencies – the Association of Bay Area Governments, the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and the Metropolitan Transportation Commission, worked together to create Plan Bay Area, the region's first sustainable communities strategy. Adopted in July 2013, the plan is projected to reduce regional greenhouse gas emissions from passenger vehicles and light duty trucks 10.3 percent by 2020 and 16.4 percent by 2035.[10]

In 2010, the California State Office of Planning and Research adopted revised CEQA Guidelines which allow local governments to streamline project-level analysis of greenhouse gas emissions through compliance with a greenhouse gas reduction plan contained in a general plan, long range development plan, or separate climate action plan. Plans must meet the criteria set forth in section 15183.5 of the CEQA Guidelines, which include requirements for quantifying existing and projected greenhouse gases; identifying a level of cumulative greenhouse gas emissions that would not be considered significant; specifying measures and standards that would ensure

10. *Association of Bay Area Governments and Metropolitan Transportation Commission, Draft Plan Bay Area Draft Environmental Impact Report,* April 2013, pages 2.5-50 and 3.1.59.

achievement of this level; and continued monitoring to track progress. The greenhouse gas reduction plan, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects such as development or infrastructure projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. This Climate Action Plan has been developed as an advisory document only, but it could be submitted to the Bay Area Air Quality Management District for review and comment and adopted as a qualified greenhouse gas reduction plan.

"CLIMATE CHANGE IS A TERRIBLE PROBLEM, AND IT ABSOLUTELY NEEDS TO BE SOLVED. IT DESERVES TO BE A HUGE PRIORITY."

- BILL GATES

YOUNTVILLE'S GREENHOUSE GAS EMISSIONS

Yountville Profile

Located in the heart of Napa Valley, Yountville is a small town with a land area of approximately 1.5 square miles. Yountville enjoys a temperate climate, with cool, wet, and almost frostless winters and warm, dry summers with frequent fog. The local climate means that natural gas consumption rises in the winter months and fluctuates according to average low temperatures during the rainy season and water use spikes during the summer.

According to the U.S. Census, the population of Yountville in 2010 was 2,933 and there were 1,252 housing units. The housing stock is relatively older, with approximately 70 per cent of the housing units built before 1990, providing excellent opportunities to upgrade homes to include more energy-efficient features (American Community Survey, 2014).

Yountville is a world-renowned wine country destination, with restaurants, wineries and hotels that serve both visitors and residents. The strong local economy provides about 1,600 jobs (ABAG 2013 Projections).

The Town has a public elementary school for grades K-5, a post office, a library, a fire station, and a Town Hall. The non-residential sector of the built environment, which includes hotels, restaurants, retail and office buildings, as well as government facilities, uses about 58 percent of all electricity and natural gas in the built environment and is responsible for 40 percent of the community's greenhouse gas emissions. As such, the non-residential sector has a significant role to play in reducing GHG emissions in the community.

Yountville enjoys good transit service. The Town is served by the VINE system, which provides bus service to towns and schools within Napa County and connects to the Vallejo ferry terminal. Nonetheless, very few Yountville residents commute to work by public transportation. While the majority of residents (62 percent) drive alone to work, approximately 5 percent carpool (American Community Survey, 2014).

The Town's climate, compact size and mostly flat topogra-

phy are conducive to walking and bicycling, and the Town's well-developed network of bicycle and pedestrian facilities and amenities provides safe and convenient routes. Approximately 14 percent of Yountville residents walk to work and one percent commute by bicycle (American Community Survey, 2014). Encouraging residents, employees and visitors to walk and bike to destinations within and outside of Town could help to reduce transportation emissions.

Community Emissions Inventory

The first step toward developing a climate action plan is to identify sources of emissions and establish baseline levels. In 2015, the Town updated its Greenhouse Gas Emissions Inventories for community and government operations emissions for the baseline year 2010. The inventories quantify greenhouse gas emissions from a wide variety of sources, from the energy used to power, heat and cool buildings, to the fuel used to move vehicles and power off-road equipment, to the decomposition of solid waste and treatment of wastewater. The reports provide a detailed understanding of where the highest emissions are coming from, and, therefore, where the greatest opportunities for emissions reductions lie. The inventories also establish a baseline emission inventory against which to measure future progress.

Community emissions are quantified according to these eight sectors:

Residential. The Residential sector includes emissions generated by the use of electricity and natural gas in homes. Emissions from wood burning and the use of diesel are also included, although they play a very small role (less than one percent) in residential emissions in Yountville.

Commercial. This sector includes emissions generated by the use of electricity and natural gas in commercial buildings. Emissions generated by schools, governments, and public agencies are included in this sector.

Transportation. The Transportation sector includes emissions from on-road vehicles travelling on local roads within the

Town limits, excluding the Veterans Home.

Off-Road Vehicles & Equipment. This sector includes emissions from vehicles and equipment used for construction, landscaping, and other off-road activities (excluding agricultural vehicles and equipment).

Waste. This sector includes emissions generated by the decomposition of solid waste deposited in landfills located outside the Town's borders.

Water. The Water sector inventories emissions generated by the use of electricity and fuel in treating, conveying and distributing water from the water source to water users in the community.

Wastewater. This sector includes emissions generated by the treatment of wastewater as well as fuel used by the wastewater treatment plant.

Agriculture. The Agriculture sector includes emissions generated from the application of nitrogen fertilizer on agricultural fields and the use of off-road agricultural vehicles and equipment.

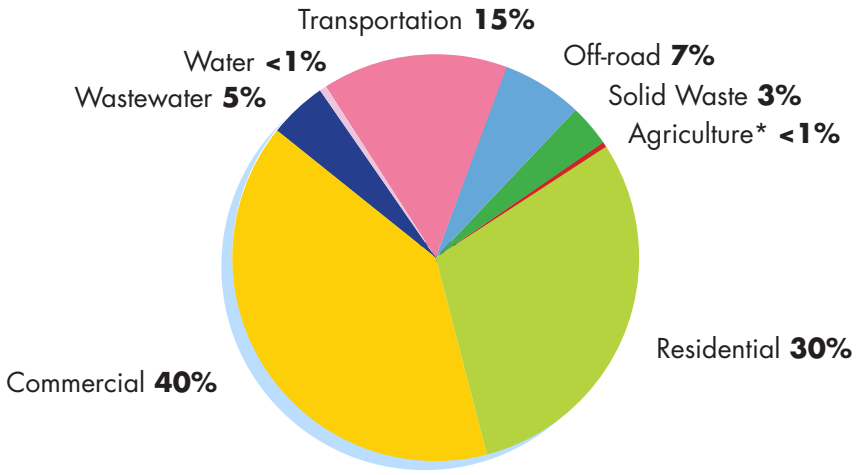
As described in Yountville's 2010 Inventory of Community Greenhouse Gas Emissions, the Town elected to report community emissions under the "significantly influenced" framework, which focuses on emissions the Town has significant influence over. As a result, the Town excluded emissions generated at the Veterans Home and from motor vehicles travelling on Highway 29. Community greenhouse gas emissions under this framework totaled 13,065 metric tons CO2e in 2010, as shown in Table 2.

Table 2: Community Emissions by Sector, 2010

SECTOR	GHG EMISSIONS ($MTCO_2e$)
Residential	3,922
Commercial	5,222
Transportation	1,961
Off-Road	848
Agriculture	24
Wastewater	608
Waste	430
Water	51
Total	13,065

Figure 2 shows that emissions from the Commercial sector are responsible for the greatest percentage of greenhouse gas emissions (40 percent). This is followed by emissions from the Residential sector (30 percent), the Transportation sector (15 percent), the Off-road sector (7 percent), and the Wastewater sector (5 percent). The Waste, Water, and Agriculture sectors are each responsible for 3 percent or less of community emissions.

Figure 2: Community Emissions by Sector, 2010



* Agriculture includes nitrogen fertilizer use and off-road agricultural equipment only.

Government Operations Emissions Inventory

In 2012, Yountville prepared a Local Government Operations Greenhouse Gas Inventory report for the baseline year of 2010. The inventory shows that local government operations emitted an estimated total of 1,086 metric tons CO_2e in 2010 from ten sectors, as shown in Table 3. By far, the largest contributor of emissions was the Town's Wastewater Treatment Plant, at 793 metric tons CO_2e. Most of these emissions (76 percent) were created from the venting of methane gas from the treatment plant's anaerobic digester into the atmosphere; the rest of the emissions were generated from the use of electricity, natural gas, diesel fuel and refrigerants at the plant. The Building and Facilities sector, which includes emissions generated from the use of electricity at Town Hall and the Community Center, was the second largest greenhouse gas contributor at 62 metric tons CO_2e.

Table 3: Government Operations Emissions Summary by Sector

SECTOR	2010 METRIC TONS CO_2e	PERCENT OF TOTAL
Wastewater Treatment	793	73%
Buildings and Facilities	62	6%
Employee Commute	53	5%
Vehicle Fleet	39	4%
Waste	35	3%
Contracted Vehicle Fleet	32	3%
Transit Fleet	24	2%
Contracted Services Facilities	20	2%
Water Transport	18	2%
Public Lighting	10	1%
Total	**1,086**	**100%**

Government operations are considered a subset of community emissions. Government operations represented approximately 8 percent of community emissions in 2010.

Emission Forecasts and Reduction Targets

The Climate Action Plan includes a business-as-usual (BAU) forecast in which emissions are projected in the absence of any policies or actions that would occur beyond the base year to reduce emissions. The forecasts are derived by "growing" 2010 emissions by forecasted changes in population, number of households, and jobs according to projections developed by the Association of Bay Area Governments. Transportation emissions are projected utilizing data provided by the Metropolitan Transportation Commission, which incorporate the vehicle miles traveled (VMT) reductions expected from the implementation of Plan Bay Area. Table 4 shows that emissions are expected to rise about 8 percent between 2010 and 2020 and 3 percent between 2020 and 2030. The Town has adopted a GHG reduction target of 20 percent below 2010 levels, which is 10,453 metric tons CO_2e.

Table 4: Community Emissions Forecast and Reduction Target

2010 EMISSIONS ($MTCO_2e$)	2020 BAU EMISSIONS ($MTCO_2e$)	2030 BAU EMISSIONS ($MTCO_2e$)	20% BELOW 2010 EMISSIONS TARGET ($MTCO_2e$)
13,065	14,053	14,464	10,453

Emissions from local government operations are forecasted to rise due to additional treatment of wastewater produced by new household formation and expanding economic activity (measured in number of jobs). No other expansion of government facilities or services is assumed. Government operations emissions totaled 1,086 metric tons CO_2e in 2010, and are

forecasted to rise 6 percent by 2020 and another 5 percent by 2030. In order to meet a 20 percent reduction target, the Town needs to reduce emissions from government operations by 869 metric tons CO_2e.

Table 5: Government Operations Emissions Forecast and Reduction Target

2010 EMISSIONS ($MTCO_2e$)	2020 BAU EMISSIONS ($MTCO_2e$)	2030 BAU EMISSIONS ($MTCO_2e$)	20% BELOW 2010 EMISSIONS TARGET ($MTCO_2e$)
1,086	1,149	1,209	869

"WE HAVE A SINGLE MISSION: TO PROTECT AND HAND ON THE PLANET TO THE NEXT GENERATION."

- FRANÇOIS HOLLANDE

PRESIDENT OF THE FRENCH REPUBLIC

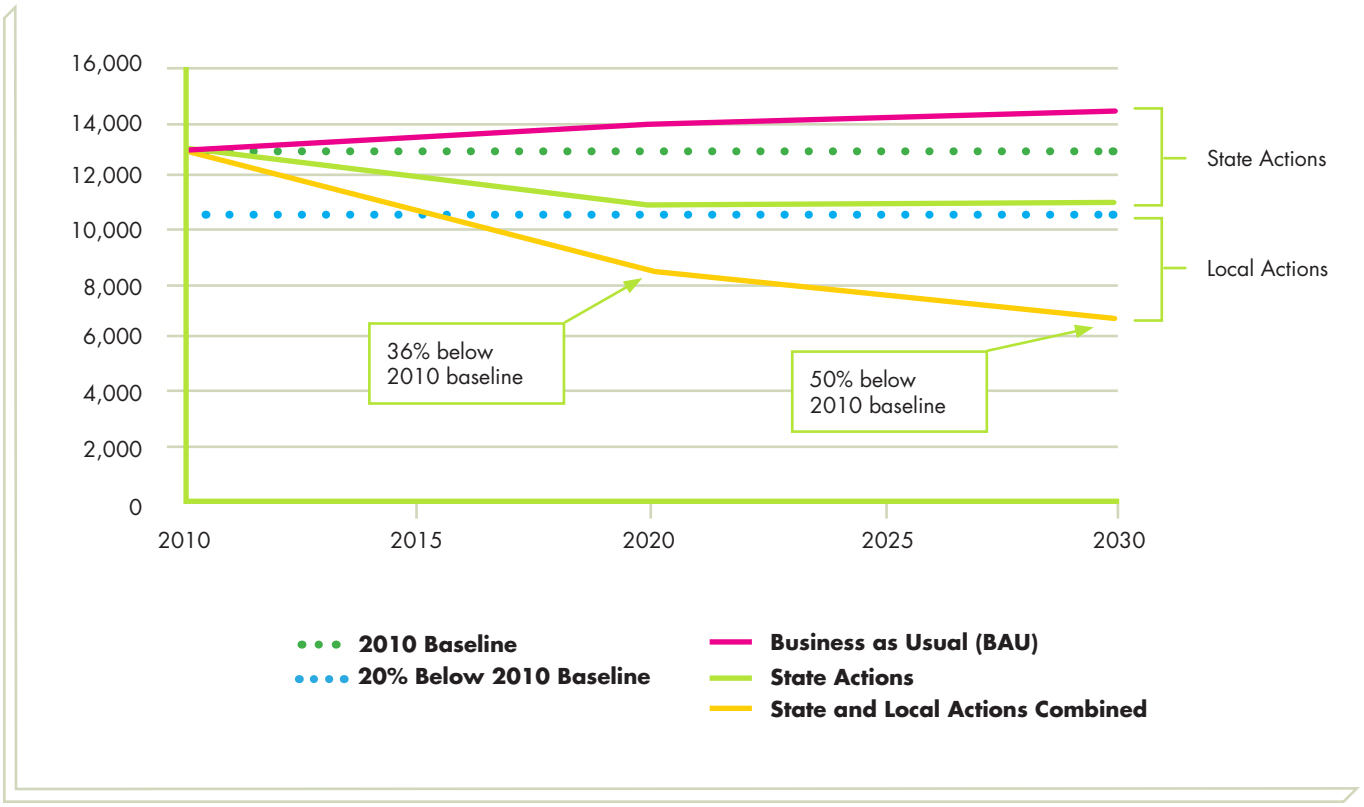
ACTIONS TO REDUCE GREENHOUSE GAS EMISSIONS

Introduction

The Climate Action Plan includes a variety of regulatory, incentive-based and voluntary strategies that are expected to reduce emissions from both existing and new development in Yountville. Several of the strategies build on existing programs while others provide new opportunities to address climate change. State actions will have a substantial impact on future emissions. Local strategies will supplement these State actions and achieve additional GHG emissions reductions. Successful implementation will rely on the combined participation of Town staff along with Yountville residents, businesses and community leaders.

The following sections identify the State and local strategies included in the Climate Action Plan to reduce community and government operations. Emissions reductions are estimated for each strategy; combined these indicate the Town will reduce emissions 36 percent below baseline emissions in 2020 and 50 percent by 2030, which is enough to surpass the State's goals for those years. As shown in Figure 3, State actions are expected to reduce emissions to 15 percent below baseline emissions in 2020, and local actions will reduce emissions another 21 percent. In 2030, State actions are projected to reduce emissions 17 percent below baseline emissions, and local actions another 33 percent. cent carpool (American Community Survey, 2014).

Figure 3: Cumulative Impact of Reduction Strategies



State Actions

The following are State reduction strategies that have been approved, programmed and/or adopted and will reduce local community emissions from 2010 levels. These programs require no local actions. As such, the State actions are first quantified and deducted from projected community emissions in order to provide a better picture of the responsibility for local action.

RENEWABLE PORTFOLIO STANDARD (RPS)

Established in 2002 in Senate Bill 1078, the Renewable Portfolio Standard program requires electricity providers to increase the portion of energy that comes from eligible renewable sources, including solar, wind, small hydroelectric, geothermal, biomass and biowaste, to 20 percent by 2010 and to

33 percent by 2020. Senate Bill 350, passed in September of 2015, increases the renewable requirement to 50 percent by the end of 2030. In 2014, PG&E's electric power generation mix contained 27 percent eligible renewable energy. Marin Clean Energy's electricity contained 57 percent eligible renewable energy.

LIGHT AND HEAVY DUTY FLEET REGULATIONS

Assembly Bill 1493 (Pavley), signed into law in 2002, requires carmakers to reduce greenhouse gas emissions from new passenger cars and light trucks beginning in 2009 through increased fuel efficiency standards. The California Air Resources Board (CARB) adopted regulations in September 2009 that reduce greenhouse gas emissions in new passenger cars, pickup trucks and sport utility vehicles for model years 2012-2016. CARB expects the new standards to reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, while improving fuel efficiency and reducing motorists' costs. The Advanced Clean Cars rule will further reduce GHG emissions from automobiles and light-duty trucks for 2017-2025 vehicle models years. CARB estimates that implementation of the ACC rule will reduce statewide emissions from light-duty vehicles by 3.8 million $MTCO_2e$ in 2020, or by approximately 2.5 percent.

TITLE 24

The California Energy Commission (CEC) promotes energy efficiency and conservation by setting the State's building efficiency standards. Title 24 of the California Code of Regulations consists of regulations that cover the structural, electrical, mechanical, and plumbing system of every building constructed or altered after 1978. The building energy efficiency standards are updated on an approximate three-year cycle, and each cycle imposes increasingly higher demands on energy efficiency and conservation. The CEC's 2007 Integrated Policy Report established the goal that new building standards achieve "net zero energy" levels by 2020 for residences and by

2030 for commercial buildings. The California Public Utility Commission's California Long Term Energy Efficiency Strategic Plan, dated July 2008, endorses the Energy Commission's zero net energy goals for all newly constructed homes by 2020 and for all newly constructed commercial buildings by 2030. Emissions reductions are based on lower energy budgets mandated by existing Title 24 energy efficiency standards.

LIGHTING EFFICIENCY AND TOXIC REDUCTION ACT

AB 1109, the Lighting Efficiency and Toxic Reduction Act, tasks the California Energy Commission (CEC) with reducing lighting energy usage in indoor residences by no less than 50 percent from 2007 levels by 2018, as well as requires a 25 percent reduction in indoor and outdoor commercial buildings by the same date. To achieve these efficiency levels, the CEC applies its existing appliance efficiency standards to include lighting products, as well as requires minimum lumen/watt standards for different categories of lighting products. The bill also expands existing incentives for energy efficient lighting.

RESIDENTIAL SOLAR WATER HEATERS

The Residential Solar Water Heater Program (AB 1470) creates a $25 million per year, 10-year incentive program to encourage the installation of solar water heating systems that offset natural gas and electricity use in homes and businesses throughout the state. The goal is to install 200,000 solar water heaters by 2017.

Table 6 shows the total emissions reductions in Yountville projected through implementation of the above State actions.

Table 6: Emissions Reductions from State Actions

STATE ACTION	2020 EMISSIONS REDUCTIONS	2030 EMISSIONS REDUCTIONS
Renewable Portfolio Standard	2,138	2,151
Title 24	216	412
Lighting Efficiency	235	235
Residential Solar Water Heaters	11	11
California Solar Initiative	92	92
Light and Heavy Duty Vehicle Regulations	234	637
Total	2,944	3,580
% Reduced Below 2010 Baseline	**15%**	**17%**

Summary of Local Greenhouse Gas Emissions Reduction Strategies

The local mitigation measures prvesented in this section, and as summarized in the tables below, achieve greenhouse gas emissions reductions in the community of approximately 2,700 metric tons CO_2e in 2020 and 4,300 metric tons CO_2e in 2030. When State reductions are added (see Table 6 for a breakdown of State actions), emissions in Yountville would be approximately 36 percent below 2010 levels in year 2020 and 50 percent below baseline emissions in 2030 – enough to allow the Town to exceed State targets for both years.

Government operations represent a subset of community emissions. Within government operations, the Town could achieve reductions of 823 metric tons CO_2e by 2020 by implementing the local reduction strategies described in this chapter and detailed in the Appendix. Combined with State actions, the Town could reduce government operations emissions 72 percent below 2010 levels by year 2020 and 74 percent by 2030 (see Table 9). A wide range of programs that result in GHG emissions reductions that exceed the State's

goal have been included to allow for the evaluation and prioritization of potential programs and capital improvement projects as new program and funding opportunities arise. The Town has already realized GHG reductions from the implementation of many of these programs, including the Methane Recapture program at the Wastewater Treatment Plant (578 metric tons CO_2e), energy efficiency projects at Town Hall, the Community Center, and the Wastewater Treatment Plant (24 metric tons CO_2e), and LED streetlight retrofits (7 metric tons CO_2e). These actions total 609 metric tons CO_2e, which means the Town has already reduced emissions from government operations 56 percent and community emissions nearly 5 percent.

Table 7: Reduction Strategies for Community Emissions

SECTOR	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
1 – Energy Efficiency and Renewable Energy	1,456	2,886
2 – Transportation	70	97
3 - Water and Wastewater	161	89
4 - Waste Reduction, Reuse and Recycling	199	354
5 - Natural Systems and Sequestration	<1*	1*
Total Local Community Actions	1,886	3,427
Local Government Operations Actions (see Table 8)	823	884
State Actions (see Table 6)	2,944	3,580
TOTAL GHG Reductions		
Baseline Emissions	13,065	13,065
Projected Emissions with Local and State Actions Implemented	8,401	6,573
% Reduced Below Baseline	36%	50%

*Sequestration emissions are shown here for informational purposes only as they are not included in the Town's Greenhouse Gas Emissions Inventory.

Table 8: Reduction Strategies for Government Operations Emissions

SECTOR	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
1 – Energy Efficiency and Renewable Energy	149	149
2 – Transportation	6	13
3 - Water and Wastewater	635	687
4 - Waste Reduction, Reuse and Recycling	33	35
5 - Natural Systems and Sequestration	1*	2*
Total Local Government Operations Actions	823	884
State Actions Impacting Government Operations	19	43
TOTAL GHG Reductions		
Baseline Emissions	1,086	1,086
Projected Emissions with Local and State Actions Implemented	307	282
% Reduced Below Baseline	72%	74%

*Sequestration emissions are shown here for informational purposes only as they are not included in the Town's Greenhouse Gas Emissions Inventory.

Energy Efficiency and Renewable Energy

The two fundamental means for reducing emissions from electricity and natural gas use are decreasing consumption through both efficiency and behavioral change, and switching from fossil fuels to renewable sources.

Increasing the efficiency of buildings is the most cost-effective approach for reducing greenhouse gas emissions. Programs that require minimum energy efficiency upgrade for home remodeling, such as increasing insulation and sealing heating ducts, have demonstrated energy savings of up to 20 percent. More aggressive "whole house" retrofits can result in even greater energy savings. Many "low-hanging fruit" improvements can be made inexpensively and without remodeling, yet can be extremely cost-efficient; these include use of efficient lighting, and use of advanced shower heads and irrigation controllers. Installing Energy Star-certified appliances

and office equipment, high-efficiency HVAC systems, and LED lighting not only save energy but reduce operating costs in the long run.

New construction techniques and building materials, known collectively as "green building," can significantly reduce the use of resources and energy and creation of waste in homes and commercial buildings. Green construction methods can be integrated into buildings at any stage, from design and construction to renovation and deconstruction. The State of California requires green building energy-efficiency through the Title 24 Building codes. The State updates these codes approximately every three years, with increasing energy efficiency requirements since 2001. The 2016 code update requires a 28 percent reduction in energy use for new homes and a 5 percent reduction for new commercial buildings over the 2013 code. The State's energy efficiency goals are to have all new residential construction to be zero net energy by 2020 and all new commercial construction to be zero net energy by 2030. Local governments can accelerate this target by adopting energy efficiency standards for new construction and remodels that exceed existing State mandates.

The Town has converted about 70% of its streetlights to energy-efficiency LED fixtures, and will work with PG&E to convert the remaining streetlights.

Yountville residents and businesses have two primary options to switch to renewable energy – either by installing solar energy systems or, beginning in 2016, purchasing Marin Clean Energy's "Deep Green" electricity from 100 percent renewable energy sources. Existing solar energy systems in Yountville supply about 3.5 percent of the residential electricity and 8.2 percent of commercial electricity needs. Local governments can help to increase solar adoption rates by providing incentives, enabling property assessed clean energy loan providers to operate within their jurisdiction, streamlining permit processing, and amending design guidelines and zoning ordinances to encourage both small and large-scale solar installations.

The Town can reduce energy consumption in its own operations by working with PG&E to upgrade the remaining streetlights to LED lights, installing solar energy systems at the Community Center, the Wastewater Treatment Plant and the Pump Station, implementing energy efficiency protocols, and purchasing energy-efficient equipment. Finally, the Town should consider offsetting the rest of its electricity use through

the purchase of Marin Clean Energy Deep Green electricity.

ACTIONS THE TOWN HAS ALREADY TAKEN

The Town has implemented the following actions to reduce energy use and foster renewable energy use in government operations and in the community:

- Replaced 200 of the Town's 284 streetlights with LED lights. These energy-efficient lights use about 50 percent less electricity. All of the remaining non-LED streetlights are owned and/or maintained by PG&E. The Town requires all new streetlight and park lighting installations to be LED lighting.
- Implemented HVAC and lighting improvements, including occupancy sensors, at the Town Hall and the Community Center, and insulated the Public Works building. At the Wastewater Treatment Plant, the Town modified aeration blowers and replaced a water heater and six motors with energy-efficient models. These improvements save the Town over 100,000 kWh of electricity and nearly 500 therms of natural gas each year.
- Approved installation of three solar energy systems at Town properties: a 217.3 kW DC ground-mount system at the Wastewater Treatment Plant; a 36.0 kW DC ground-mount system at the Pump Station; and a 95.4 kW DC carport structure at the Community Center. These three systems will produce nearly 515,000 kWh of electricity each year, which is approximately 80 percent of the electricity these facilities consumed in 2014.
- Joined Marin Clean Energy (MCE), which gives Yountville residents and business the choice to either use MCE electricity or remain with PG&E as their electricity provider. MCE provides high renewable energy content electricity and 100% renewable electricity options. MCE has committed to providing its customers with electricity that is at least 95 percent greenhouse gas free by 2025.
- Implemented the California CALGreen Building Standards Code and the Energy Standards Code, which require energy-efficient buildings.
- Adopted an ordinance to enable HERO, a property-assessed clean energy (PACE) program, to operate within the Town's jurisdiction. PACE programs allow a property owner to finance energy-saving projects on their property

tax bill. Projects may include solar PV panels, solar water heaters, energy-efficient windows and HVAC systems, insulation, electric vehicle charging stations, artificial turf, pool pumps, and irrigation systems.

Table 9: Energy Efficiency and Renewable Energy Strategies

STRATEGY	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
Community Actions		
1-1 Solar Energy	273	168
1-2 Residential Energy Efficiency	330	576
1-3 Commercial Energy Efficiency	420	700
1-4 Residential Green Building Ordinance	18	24
1-5 Commercial Green Building Ordinance	29	45
1-6 Marin Clean Energy	385	1,373
Government Operations Actions		
1-7 Public Lighting	10	10
1-8 Municipal Energy Efficiency Projects	24	24
1-9 Municipal Energy Efficiency Protocols and Equipment	3	3
1-10 Municipal Solar	105	105
1-11 Municipal Electricity	8	8
TOTAL GHG Reductions	**1,605**	**3,035**

RECOMMENDED COMMUNITY ACTIONS

CAP 1-1

Solar Energy. Encourage residents and business to install solar energy systems.

CAP 1-1a

Consider providing financial incentives for solar energy and hot water system installation, such as reducing or waiving permit fees.

CAP 1-1b

Adopt streamlined permitting procedures, such as over-the-counter approval of solar permits.

CAP 1-1c

Consider amending design guidelines and the zoning ordinance to allow solar systems in setbacks and to encourage ground-mount systems as well as installation on building roofs and over parking areas.

CAP 1-1d

Participate in property assessed clean energy (PACE) financing programs and bulk purchasing programs.

CAP 1-1e

Consider adopting an ordinance to require new homes and commercial buildings to install a solar energy system when feasible.

With only about 3% of homes generating solar energy, Yountville has a lot of untapped potential for residential solar.

CAP 1-2

Residential Energy Efficiency. Promote and encourage resident participation in energy efficiency rebates and incentive programs offered by organizations such as Napa County Energy Watch, PG&E and Marin Clean Energy.

CAP 1-2a

Consider developing a program to give away free energy-efficient lights at Town events and/or a swap that provides free LED lights in exchange for old incandescent lights.

CAP 1-3

Commercial Energy Efficiency. Promote commercial energy efficiency and demand response programs provided through Napa County Energy Watch (a partnership of PG&E and Sustainable Napa County), PG&E and Marin Clean Energy.

CAP 1-3a

Work with Napa County Energy Watch to develop an outreach program targeted to commercial energy users.

CAP 1-4

Residential Green Building Ordinance. Consider updating the building codes to mandate higher building energy performance in newly constructed residential buildings and additions.

Bardessono, one of the few hotels in the United States with a LEED Platinum certification, provides a stunning example of how green building can be practical, economical, and beautiful. The hotel features solar PV, a ground source water system to heat and cool rooms, and water and energy-efficient fixtures and design features.

CAP 1-5

Commercial Green Building Ordinance. Consider updating the building codes to mandate higher building energy performance in newly constructed non-residential buildings and additions.

CAP 1-6

Marin Clean Energy. Encourage Marin Clean Energy to reach its goal to provide Light Green power content that is 95 percent greenhouse gas free by 2025. Encourage homeowners and businesses to purchase Marin Clean Energy's Deep Green 100 percent renewable electricity.

RECOMMENDED GOVERNMENT OPERATIONS ACTIONS

CAP 1-7

Public Lighting. Continue to install all new streetlights and park lighting with energy-efficient LED lighting. Work with PG&E to replace the remaining non-LED streetlights with LED lighting either by encouraging PG&E to retrofit the streetlights or arranging for a Town buyout of the streetlights.

CAP 1-8

Municipal Energy Efficiency Projects. Identify and complete energy-efficiency projects.

CAP 1-9

Municipal Energy Efficiency Protocols and Equipment. Install energy management software and implement energy efficiency protocols such as turning off computers when not in use and reducing energy use through thermostat control. Implement a sustainable purchasing policy that emphasizes recycled materials and Energy Star-certified appliances and office equipment.

CAP 1-10

Municipal Solar. Evaluate installation of solar PV at Town facilities where feasible.

CAP 1-11

Municipal Electricity. Evaluate and consider purchase of 100 percent renewable electricity, such as Marin Clean Energy's Deep Green electricity, for all Town facilities.

Transportation

Transportation emissions include greenhouse gasses emitted from vehicles traveling on local roads (excluding roads within the Veterans Home property) and emissions from the operation of off-road vehicles and equipment. These emissions represent 15 percent of community emissions. Federal and State legislation aimed at improving vehicle fuel efficiency will have the single greatest impact on reducing transportation emissions over the next fifteen years. Nonetheless, there is significant work that the local government can undertake to encourage residents, employees and visitors to use alternative modes of transportation, including bicycling, walking and public transportation. Local governments can expand the network of pathways, sidewalks and bicycle routes and lanes, and ensure there are adequate facilities to lock and store bicycles. Improving safety and ensuring there are adequate multi-modal connections help to maximize use of these facilities.

The park-and-ride lot at Solano Avenue and Highway 29 provides electric vehicle charging and a bike locker.

The Town is a member of the Napa Valley Transportation Authority (NVTA, formerly the Napa County Transportation and Planning Agency), which operates the VINE transit system and provides funding and numerous programs to encourage alternative transportation. In 2012, NVTA redesigned the Vine system to better meet the needs of the community and transit riders. The agency has also made several improvements to busses to encourage ridership, including express busses, wi-fi, reclining seats, and tray tables. A "Where's My Bus?" app enables riders to see exactly when a bus will arrive at any bus stop in the VINE system. These improvements helped to

double ridership between 2010 and 2015. NVTA also operates the Yountville Trolley, a free bus service within Yountville that is financially supported by the Town.

NVTA provides a variety of transportation demand reduction programs for local employees, including the following:

- Emergency Ride Home – provides a free ride home in an emergency to anyone who uses alternative transportation (carpool, vanpool, train, ferry, bus, walk or bicycle) to get to work.
- Bucks for Bikes – provides a financial incentive for the purchase of a commuter bicycle equal to 60 percent of the cost of a new bike, up to $100.
- Vanpool Incentives – provides financial incentives to start a vanpool, including up to $300 in free gas cards.
- Carpool and vanpool matching.
- Napa Commute Challenge –provides financial rewards for employers and employees that use alternative transportation to get to work for at least 30 days between April 1 and June 30.
- Commute assistance and trip planning.

NVTA also builds infrastructure designed to encourage alternative transportation. The 47-mile Napa Valley Vine Trail is a shared bicycle and pedestrian path that will ultimately connect Calistoga to the Vallejo ferry terminal, and will be used by visitors, residents, and commuters. A renovated park-and-ride lot at Solano Avenue and Highway 29 now provides an electric vehicle charging station and a secure locker for bike storage.

Increasing the use of electric vehicles is an important way to reduce emissions, as electric vehicles are estimated to generate less than 20 percent of the emissions produced by a gas-powered vehicle. There are several publically accessible electric vehicle charging stations in Yountville located at hotels and Town parking lots. The CALGreen building code requires new commercial and multifamily buildings to provide electric vehicle parking spaces and "raceways", or conduit, that will enable future installation of electric vehicle (EV) chargers. New single family homes and town homes with private garages are required to provide raceway and electrical service panels with capacity for future EV charging. The Town could adopt reach codes that require new commercial and multifamily de-

velopment to install EV chargers, and residential development with private garages to provide 240-volt electrical service for electric vehicle charging.

ACTIONS THE TOWN HAS ALREADY TAKEN

The Town has taken the following actions to reduce transportation emissions in government operations and in the community:

- Purchased two electric vehicles for the Town fleet and has a policy to upgrade to more fuel-efficient or electric vehicles whenever possible as vehicles are replaced.
- Purchased a hybrid vehicle for Town employee commuting.
- Installed one dual-port electric vehicle charging station at Town Hall and four dual-port charging stations at the Community Center.
- Completed pedestrian and bicycle infrastructure and safety improvements to encourage residents, employees and visitors to walk or bike rather than drive to their destinations.

Table 10: Transportation Strategies

STRATEGY	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
Community Actions		
2-1 Pedestrian Travel	17	25
2-2 Bicycle Travel	21	15
2-3 School Transportation	4	3
2-4 Public Transit	5	5
2-5 Ridesharing	7	11
2-6 Electric Vehicles	8	30
2-7 Vehicle Idling	2	2
2-8 Spare the Air Day Alerts	2	2
2-9 Leaf Blowers	2	3
Government Operations Actions		
2-10 Low Emission Town Vehicles	4	10
2-11 Town Employee Commute	3	3
2-12 Town Leaf Blowers	<1	<1
TOTAL GHG Reductions	**76**	**110**

RECOMMENDED COMMUNITY ACTIONS

CAP 2-1

Pedestrian Travel. Encourage walking as an alternative to vehicular travel.

CAP 2-1a

Establish and maintain a system of pedestrian facilities and crossing enhancements that are consistent with the Town's Bicycle Master Plan. (General Plan Policy C 2.1)

CAP 2-1b

Require development projects to construct sidewalks and walkways on and offsite in order to maintain consistency with the Town's Bicycle Master Plan, and as

dictated by the location of transit stops and common pedestrian destinations. (General Plan Policy C 2.3)

CAP 2-1c
With the exception of the Old Town district, gaps in sidewalks and walkways should be identified and a plan to fill these gaps completed. (General Plan Policy C 2.6)

CAP 2-1d
Enhance the safety of any pedestrian crossings in the Town. (General Plan C 2.9)

CAP 2-1e
Consider establishing a "Pedestrian Only" zone on Washington Street if adequate off-site parking facilities and connecting transit service are available.

CAP 2-2
Bicycle Travel. Encourage biking as an alternative to vehicular travel.

CAP 2-2a
Establish and maintain bicycle facilities that are consistent with the network depicted in the Town's Bicycle Master Plan. (General Plan Policy C 2.10)

CAP 2-2b
Public road construction projects shall incorporate facilities identified in the Bicycle Master Plan to the greatest extent feasible. (General Plan Policy C 2.11)

CAP 2-2c
Bicycle parking facilities such as bike racks, bike lockers, and secure bike corrals shall be provided at locations where there is a concentration of residents, visitors, students, or employees. (General Plan Policy C 2.12)

Yountville's bike lanes and paths make it easy and safe for residents and visitors to bike around town.

CAP 2-2d

Provide pedestrian and bike connections which link residential areas with local-serving businesses and recreational facilities, including parks, schools, the Post Office, Town Hall, Community Hall and the commercial core. (General Plan Policy C 2.13)

CAP 2-2e

Work with the NCTPA to acquire funding to complete the planned bicycle facilities. (General Plan Policy C 2.14)

CAP 2-2f

Encourage pedestrian/bike connections where none currently exist including alleys. (General Plan Policy C 2.15)

The Vine Trail will eventually stretch 47 miles, from the Vallejo Ferry Terminal and Calistoga.

CAP 2-2g

Consider updating the zoning ordinance to specify requirements for shower and changing facilities for new commercial development in order to encourage commuting by bicycle.

CAP 2-2h

Work with transit providers to ensure there are adequate facilities to transport bicycles.

CAP 2-2i

Educate residents and employees about the health and environmental benefits of walking and cycling and provide information in public places to assist in utilizing these modes of travel.

CAP 2-2j

Work with the Napa Valley Transportation Authority to implement programs in the Countywide Bicycle Plan, including the following:

1. A bicycle education and awareness program;
2. A traffic safety campaign;

3. A "Share the Road" campaign to increase motorists' awareness of bicyclists;
4. A Bicycle Ambassadors program to promote bicycling in the community;
5. A bike share program developed through public-private partnerships to serve the tourism industry as well as local community members;
6. A bicycle fleet for local agency staff;
7. Bicycle education and encouragement programs (Napa Bike Program);
8. A countywide bicycle signing program;
9. A bicycle parking program; and
10. A bicycle facility maintenance program.

CAP 2-3

School Transportation. Encourage bicycling, walking, carpooling, and taking public transit to school.

CAP 2-3a

Prioritize bicycle and pedestrian safety for students travelling to and from school. (General Plan Policy C 2.21)

CAP 2-3b

Continue to work with the Yountville Police Department. (General Plan Policy C 2.22)

CAP 2-3c

Develop a Safe Routes to School Program and strive to improve infrastructure for parents and students choosing to walk and bike to school by promoting school faculty and parent participation, applying for Safe Routes to School grants, identifying the issues associated with unsafe bicycle and pedestrian facilities between neighborhoods and schools, and executing plans to improve those facilities. (General Plan Policy C 2.23)

CAP 2-4

Public Transit. Support and promote public transit.

CAP 2-4a

Maintain the trolley system to serve local transit needs. (General Plan Policy C 2.16)

CAP 2-4b

Work with the Vine Transit to create an effective Rider Awareness Program that will educate the public on the existing transit systems. (General Plan Policy C 2.17)

CAP 2-4c

Continue to provide local public transportation, if financially feasible, to the entire town including the Veterans Home of California. (General Plan Policy C 2.18)

CAP 2-4d

Continue to support efforts to maintain all regional and town bus service. (General Plan Policy C 2.19)

CAP 2-4e

Continue to cooperate with the Veterans Home of California to provide public transportation to residential neighborhoods and the business district. (General Plan Policy C 2.20)

CAP 2-4f

Work with the Napa Valley Transportation Authority to maximize VINE transit ridership through expansion and/or improvement of bus routes and schedules.

CAP 2-4g

Consider working with a private tour operator and local Chambers of Commerce to provide "luxury" bus service for visitors to Upper Valley destinations.

CAP 2-4h

Evaluate replacing the Yountville trolley with an electric vehicle.

CAP 2-5

Ridesharing. Support and promote ridesharing programs.

CAP 2-5a

Consider adopting development requirements to require preferred parking for carpool and vanpool vehicles.

CAP 2-5b

Work with the Napa Valley Transportation Authority to promote transportation demand programs to local employers, including rideshare matching programs, vanpool incentive programs and emergency ride home programs.

CAP 2-6

Electric Vehicles. Increase ownership of electric vehicles.

CAP 2-6a

Consider installing additional electric vehicle stations at Town facilities.

CAP 2-6b

Consider requiring new and redeveloped commercial and multi-family projects to provide electric vehicle charging stations.

CAP 2-6c

Consider requiring new single family residential development to provide electrical service for potential electric vehicle charging.

CAP 2-6d

Participate in regional efforts and grant programs to encourage widespread availability of charging stations.

CAP 2-7

Vehicle Idling. Consider adopting an ordinance to prohibit commercial vehicle idling, including hired limousines, for periods longer than five minutes.

The Town has installed electric vehicle charging stations at Town Hall and the Community Center.

CAP 2-8

Spare the Air Day Alerts. Consider assisting the Bay Area Air Quality District in promoting Spare the Air Day alerts. Add a Spare the Air Alert Status widget to the Town's website and provide information to community members on how they can register for Spare the Air Day alerts.

CAP 2-9

Leaf Blowers. Consider adopting an ordinance to ban or regulate the use of gasoline-powered leaf blowers as technology advancements make alternatives more attractive. At a minimum, encourage the use of electric and battery-operated leaf blowers instead of gasoline-powered leaf blowers.

RECOMMENDED GOVERNMENT OPERATIONS ACTIONS

CAP 2-10

Low Emission Town Vehicles. Purchase or lease low or zero-emissions vehicles and the most fuel-efficient models for the Town fleet whenever feasible.

The Town has two electric cars in its fleet and is committed to purchasing the most energy-efficient vehicles when it's time to replace existing vehicles.

CAP 2-11

Town Employee Commute. Provide Town employees with incentives to use alternatives to single occupant auto commuting, such as transit subsidies, bicycle facilities, ridesharing services, flexible schedules, and telecommuting when practical. Provide incentives to commute in electric vehicles, such as free EV charging.

CAP 2-12

Town Leaf Blowers. Consider replacing the Town's gasoline-powered leaf blowers with electric or battery-operated leaf blowers as technology advancements make these alternatives more attractive.

Water and Wastewater

WATER

Yountville has an agreement with the California Department of Veterans Affairs (CDVA) to provide the Town with 500 acre feet of drinking water per year, and more when it is available. The CDVA treats water from Rector Reservoir for the Veterans Home of California, the California Department of Fish & Game and the Town. In an emergency, the Town purchases water from the City of Napa and can use the municipal well that was built in 2005.

Water conservation efforts not only save water but reduce the demand for electricity to pump, treat and convey water from the water source to water users in Yountville. In addition, conservation reduces the need to treat wastewater at the Wastewater Treatment Plant, where GHG emissions are created during the treatment process and through the consumption of energy to run the facilities.

The State mandates water-efficient fixture and landscaping through the State building codes and other State laws. New residential and non-residential construction is required to install water-efficient fixtures, including low-flow faucets and showerheads and water-efficient toilets and urinals. In addition, single family homes are required to replace all non-compliant plumbing fixtures in the home whenever remodeling. Non-compliant fixtures include toilets that use more than 1.6 gallons per flush and showerheads with a flow capacity of more than 2.5 gallons per minute. As of January 1, 2017, single family homeowners will be required to replace all non-compliant fixtures upon resale. Commercial and multi-family building owners will be subject to similar requirements in 2019.

The State's model Water Efficient Landscape Ordinance requires water-efficient landscaping through the design, installation, and maintenance of new and rehabilitated landscape projects. The law currently applies to new construction projects with a landscape area greater than 500 square feet and rehabilitated landscape projects with a landscape area of 2,500 square feet or more. In addition, the CALGreen building code requires weather or soil-based controllers for landscaping that

automatically adjust irrigation in response to changes in plant watering needs as weather or soil conditions change.

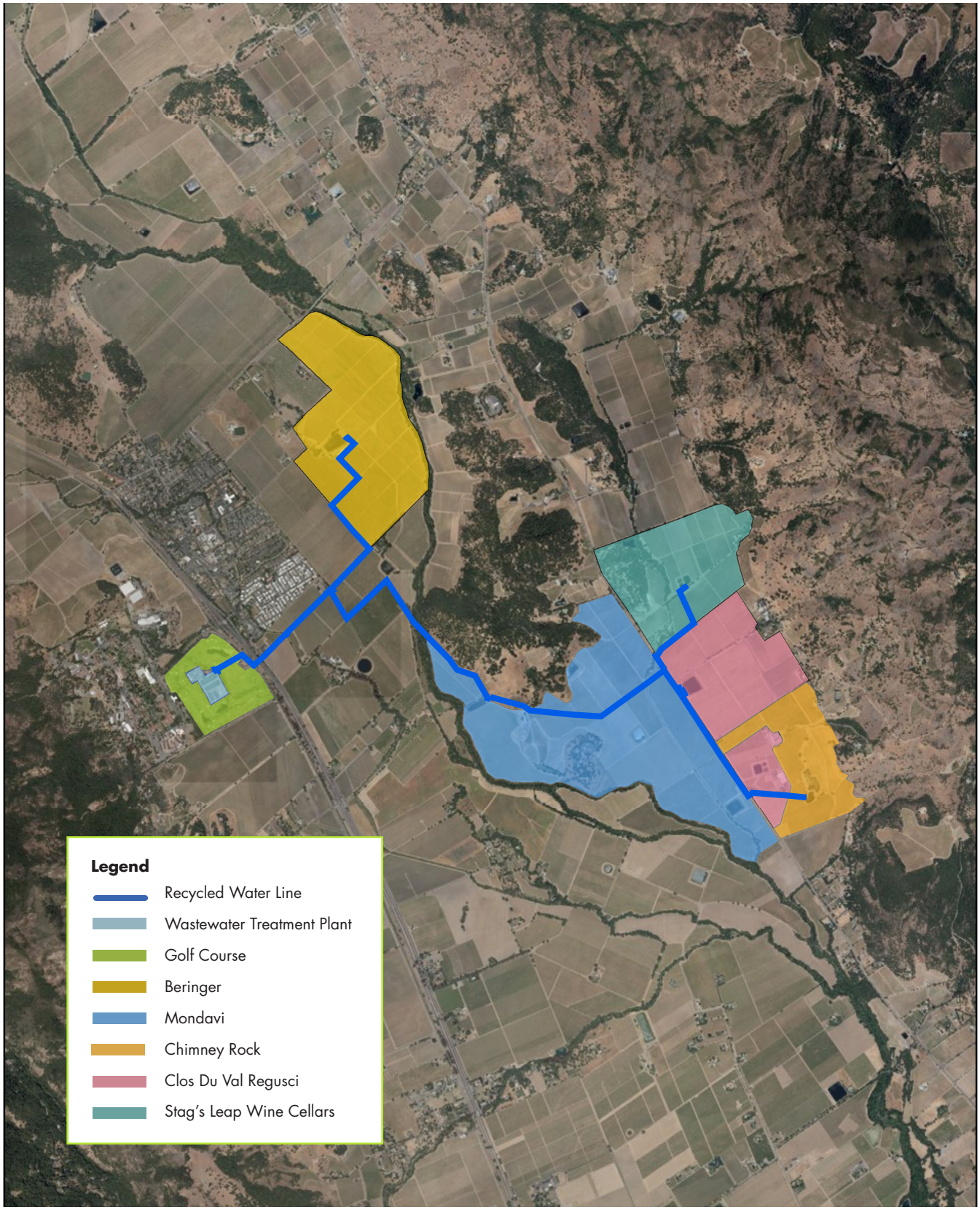
WASTEWATER

The Yountville Wastewater Treatment Plant treats wastewater produced by the Yountville community, including the Veterans Home. As wastewater is treated, chemical processes in anaerobic conditions create two greenhouse gases, methane and nitrous oxide. In 2010, the Wastewater Treatment Plant was the largest source of government operations emissions (793 metric tons CO2e), largely due to the venting of methane into the atmosphere. The Town implemented a Methane Recapture Program in 2012 which re-uses digester gas to heat digester sludge, thereby preventing methane from being released into the atmosphere and displacing natural gas that was previously purchased from PG&E. Methane is now either re-used or flared off, although a small percentage (approximately 1 percent) escapes into the atmosphere. This single program reduced 2010 emissions by approximately 578 metric tons CO2e, which is more than half of government operations emissions.

The Town's recycled water program recycles 89% of wastewater for use at the Vintner's Golf Course and four vineyards on the east side of Napa River.

The Wastewater Treatment Plant treats all of the wastewater so that it can be used for irrigation. During periods of high flows and when a 45/1 dilution ratio is achieved, the Town is able to discharge the highly treated effluent to the Napa River. The Town has a recycled water line from the treatment plant to the Vintner's Golf Course and five wineries on the east side of the Napa River, as shown in Figure 4. In 2015 the Town recycled 89 percent of wastewater and has the capability to recycle 100% if conditions permit. The recycled water program could potentially be expanded to irrigate other parks, such as the Veterans Memorial Park and The Alameda at the Veterans Home.

Figure 4: Town of Yountville Recycled Water Line

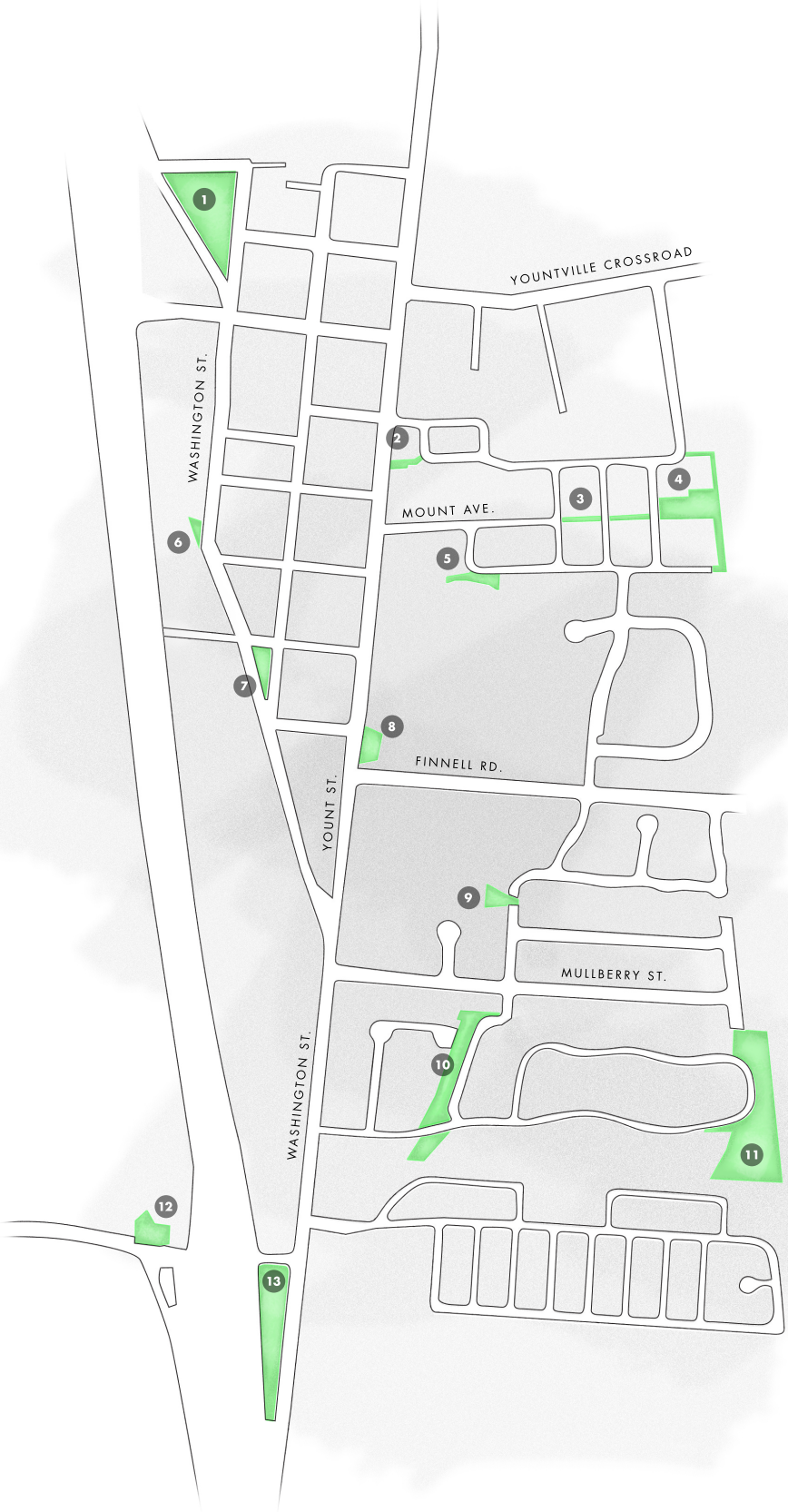


ACTIONS THE TOWN HAS ALREADY TAKEN

The Town has taken the following actions to conserve water in government operations and in the community, and to reduce emissions from water and wastewater treatment and conveyance:

- Provides rebates for water-efficient toilets and low-flow fixtures. The Town currently provides a $100 incentive for each toilet replacing a 3.0+ gallons per flush (gpf) toilet with a toilet using no more than 1.28 gpf, and up to $100 for replacing inefficient shower heads and bathroom sink faucets and accessories.
- In partnership with PG&E, provides a rebate of up to $150 for replacing inefficient washing machines.
- Provides a cash incentive of $1.00 per square foot, up to $750 for a single family home and $2,500 for a commercial or multi-family building, to replace turf grass with drip-irrigated low water use plants.
- Works with the City of Napa to provide Waterwise Gardening workshops and promote water conservation.
- Adopted the State Water Efficient Landscape Ordinance and implements State regulations for water-efficient plumbing fixtures and landscapes.
- Installed water-efficient plumbing fixtures in the Town Hall and Community Center.
- Installed an EPIC irrigation system to irrigate the lawn on the north side of Community Hall from below the ground, which greatly reduces the amount of irrigation water and loss of water to evaporation.
- Installed new efficient sprinklers and weather-based irrigation controllers.
- Replaced park and pathway landscaping with drought-tolerant plants as shown in Figure 5.
- Replaced residential and commercial water meters with new meters that allow property owners to better track usage and improve leak detection.

Figure 5: Locations of Drought Tolerant Landscaping on Town-owned Land



1. Yountville Park
2. Lande Path
3. Forester Creek Path
4. Forester Park
5. Three Weir Park
6. Hopper Creek Path
7. Van de Lear Park
8. Town Hall
9. Heritage Park
10. Oak Leaf Bridge Park and Hooper Creek Trail
11. Vineyard Park
12. California Drive Wayside
13. Veterans Memorial Park

Table 11: Water and Wastewater Strategies

STRATEGY	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
Community Actions		
3-1 Indoor Water Use	150	83
3-2 Outdoor Water Use	11	7
3-3 Rainwater Catchment	<1	<1
3-4 Greywater Systems	<1	<1
Government Operations Actions		
3-5 Wastewater Treatment	633	686
3-6 Water Efficient Landscaping	1	1
TOTAL GHG Reductions	**796**	**777**

RECOMMENDED COMMUNITY ACTIONS

CAP 3-1

Indoor Water Use. Reduce indoor water use in residential and commercial buildings.

CAP 3-1a

Implement State law requirements for water-efficient fixtures and consider adopting CALGreen Tier 1 requirements.

CAP 3-1b

Provide rebates and incentives for plumbing fixture and appliance replacement, including older toilets, urinals, showerheads, faucets, washing machines and dishwashers, as funding permits.

CAP 3-1c

Provide free or low-cost indoor water audits in which a trained person inspects the household or small business water delivery system and identifies opportunities to reduce water use (leaks, fixtures, appliances, practices, etc.).

CAP 3-1d

Provide free water-saving devices, including toilet flappers, showerheads, and faucet aerators, potentially in concert with water audits or a community workshop or event.

CAP 3-1e

Utilize the Town's website, newsletter, community events, and other communication channels to educate the public on indoor water conservation practices, available financial incentives and programs, and water-efficient fixture requirements for new buildings, remodels, and resales.

CAP 3-1f

Partner with agencies that provide workshops and classes to educate homeowners and business owners on ways to reduce indoor water use.

CAP 3-2

Outdoor Water Use. educe outdoor water use.

CAP 3-2a

Continue to implement the State's model Water Efficiency Landscape Ordinance that requires water efficient landscaping through the design, installation, and maintenance of new and rehabilitated landscape projects.

CAP 3-2b

Continue existing incentive program that provides financial incentives to replace lawn area with drought-tolerant plants or permeable hardscape.

CAP 3-2c

Provide rebates or financial incentives to residents and businesses to install weather-based irrigation controllers.

The Town has replanted parks and pathways with drought tolerant landscaping and has installed weather-based irrigation controllers. The lovely Oak Circle Park renovation project, pictured here, has a solar-powered irrigation system.

CAP 3-2d

Provide free or reduced-cost landscape audits in which a trained person inspects the landscape water delivery system to identify opportunities to reduce water use (leaks, sprinklers and irrigation systems, hoses, landscape materials, practices, etc.).

CAP 3-2e

Utilize the Town's website, newsletter, community events and other communication channels to educate the public on water-efficient landscaping, rainwater catchment systems, and greywater systems. Publicize available financial incentives and programs. Provide information on water-efficient landscape requirements for new and remodeled landscape projects.

CAP 3-2f

Partner with agencies that provide workshops and classes to educate homeowners and business owners on ways to reduce outdoor water use and use captured rainwater and greywater for irrigation.

CAP 3-2g

Install a demonstration garden with locally-available, low-water use plants to provide ideas for water-efficient landscaping.

CAP 3-3

Rainwater Catchment. Reduce potable water use for landscape irrigation.

CAP 3-3a

Consider requiring new construction and major remodels to install rainwater storage systems, such as rainwater cisterns and storage tanks.

CAP 3-3b

Provide rebates or financial incentives to residents and businesses to install rainwater catchment devices and storage systems, such as rain barrels and cisterns.

CAP 3-3c

Create a bulk purchasing and delivery program for rain barrels.

CAP 3-4

Greywater Systems. Reduce potable water use for landscape irrigation.

CAP 3-4a

Consider requiring new construction to install greywater systems that reuse greywater for landscape irrigation.

CAP 3-4b

Consider providing rebates or financial incentives to residents and businesses to install greywater systems.

RECOMMENDED GOVERNMENT OPERATIONS ACTIONS

CAP 3-5

Wastewater Treatment. Reduce greenhouse gas emissions associated with the treatment of wastewater.

CAP 3-5a

Continue to improve the methane recapture program at the Wastewater Treatment Plant. Maximize the use of captured methane gas to reduce the Town's need to purchase natural gas for plant operations.

CAP 3-5b

Consider expanding the recycled water system to irrigate other parks, such as the Veterans Memorial Park and, if requested by the California Department of Veterans Affairs, The Alameda at the Veterans Home.

CAP 3-6

Water-Efficient Landscaping. Continue to replace spray irrigation with drip irrigation systems and utilize weather-based irrigation controllers wherever feasible. Continue to replace plants with drought-tolerant species when renovating landscaping.

The methane recapture program, completed in 2012, uses digester gas produced during wastewater treatment to run the treatment plant. About 61 percent of the digester gas is used for fuel and the rest is flared off.

Waste Reduction, Reuse and Recycling

The reduction of waste, as well as the reuse and recycling of products, is key to reducing impacts on the environment. It is necessary to rethink what has traditionally been regarded as garbage and treat all materials as valued resources instead of items to discard. This requires shifting consumption patterns, more carefully managing purchases, and maximizing the reuse of materials at the end of their useful life.

Upper Valley Disposal & Recycling diverts about 75% of waste from the landfill. A methane collection system at the Clover Flats Landfill produces over 6 million kilowatts of electricity each year.

The Town contracts with Upper Valley Disposal Service (UVDS) for residential and commercial recycling and waste collection and processing services. UVDS owns and operates the Clover Flat Landfill, located outside Calistoga, and the Upper Valley Recycling Redemption Center, located south of St. Helena. Waste from government operations includes refuse from Town buildings, parks and street cans, as well as sludge from the Wastewater Treatment Plant's drying beds.

Emissions from the waste sector are an estimate of methane generation from the decomposition of organic solid waste and alternative daily cover sent to the landfill. These emissions are not generated in the year the waste is landfilled, but instead result from the decomposition of the waste over 100+ years. About 75 percent[11] of landfill methane emissions are captured through landfill gas collection systems, but the remaining 25 percent escape into the atmosphere as a significant contributor to global warming. Approximately two-thirds of Yountville's landfilled waste is organic (paper, cardboard, wood, yard trimming, food scraps, etc.); diverting this waste from the landfill is what will reduce greenhouse gas emissions.

Recycling and composting diversion programs are very important tools for reducing greenhouse gas emissions in the community. Composting of biologic waste, such as food and yard waste and sludge, not only reduces the volume of waste material in the landfill, the end compost product can be used as a soil enhancer.

Composting is typically an aerobic process and a large frac-

11. *U.S. Environmental Protection Agency, Compilation of Air Pollutant Emissions Factors,* AP-42, Fifth Edition, January 1995.

tion of the degradable biologic carbon in the waste material is converted into carbon dioxide. Methane is formed in anaerobic sections of the compost, but is oxidized to a large extent in the aerobic sections of the compost. Anaerobic sections are created in composting piles when there is excessive moisture or inadequate aeration, or mixing, of the compost pile. The estimated methane released into the atmosphere ranges from less than one percent to a few percent of the initial carbon content in the material. Composting can also produce emissions of nitrous oxide. The range of the estimated emissions varies from less than 0.5 percent to 5 percent of the initial nitrogen content of the material. The greenhouse gas emissions protocol does not currently include standardized methodologies as it assumes well-managed piles of compost are adequately aerated and emit negligible methane and nitrous oxide emissions.

New State legislation is focusing on eliminating organics from the landfill in an effort to reduce greenhouse gas emissions. Commencing January 1, 2020, landfill operators will no longer be allowed to count green material used as alternative daily cover (ADC) towards its recycling targets. Upper Valley Disposal Services states that 100 percent of organic ADC material will be diverted to compost or converted to renewable energy at a planned biomass gasification plant at the Clover Flat Resource Recovery Center by 2020. UVDS currently has a high recycling rate. The facility recycled 71 percent of waste in 2012 (excluding ADC) and has a goal to reach nearly 75 percent recycling by 2020.

State law currently requires all businesses and public entities that generate four cubic yards or more of waste per week and multifamily buildings with five or more units to recycle. Also, businesses that generate eight cubic yards of organic waste or more a week are required to source separate food scraps and yard trimmings and arrange for recycling services of that organic waste. By 2019, the requirement will be expanded to cover businesses generating 4 cubic yards a week of solid waste, and may be imposed on smaller business operations in 2020 if State targets are not met. The statewide goal is to divert 50 percent of all organic commercial waste diverted from the landfill by 2020 and 95 percent by 2030.

Another source of greenhouse gas emissions is from wood

and other organic waste found in construction and demolition debris. The State's CALGreen building code currently mandates 50 percent of nonhazardous construction and demolition waste to be diverted from the landfill. The requirement applies to new residential and commercial construction, as well as additions and alterations that meet certain thresholds. The requirement increases to 65 percent beginning in January 2017.

UVDS implements all State laws and plans to meet recycling and diversion targets through expanded food waste programs to residences as well as businesses, increased gasification tons, and expanded mandatory commercial recycling.

ACTIONS THE TOWN HAS ALREADY TAKEN

The Town has taken the following actions to reduce waste and increase recycling in government operations and in the community:

- Partnered with Upper Valley Disposal Service to promote recycling and composting services.
- Installed water bottle refilling stations at Vineyard Park and Yountville Community Park, and plans to install one at Veterans Park.
- Installed recycling bins at all Town buildings and parks and along streets.
- Adopted an ordinance prohibiting retailers from providing single-use plastic bags to carry merchandise out of a store.
- Provides hazardous waste collection service at the Hazardous Waste Recycling Center, located at the Town Public Works Corporation Yard.
- Sponsors the Yountville Town Wide Yard Sale where community members offer their unwanted items for resale and reuse.

Table 12: Waste Reduction, Reuse and Recycling Strategies

STRATEGY	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
Community Actions		
4-1 Community Waste	199	354
Government Operations Actions		
4-2 Municipal Waste	33	35
TOTAL GHG Reductions	**232**	**389**

RECOMMENDED COMMUNITY ACTIONS

CAP 4-1

Community Waste. Reduce waste sent to the landfill by composting organic materials, increasing recycling, reusing materials, and reducing consumption.

CAP 4-1a

Work with Upper Valley Disposal Services to develop and implement a pilot project to collect food waste from residences. Explore expanding this program to include grocery stores.

CAP 4-1b

Require recycling, composting and reusable or compostable dishes and cups at public events and at private events held at public facilities.

CAP 4-1c

Provide recycling and composting containers with clear and visible educational signage in public areas and at all Town facilities.

CAP 4-1d

Expand and promote household hazardous waste collection programs and the Town's household hazardous waste collection facility.

CAP 4-1e

Consider developing a community garden with a composting area.

CAP 4-1f

Install water bottle refilling stations at public restrooms, the Community Hall, parks, and other locations accessible to trails.

CAP 4-1g

Consider providing incentives for the installation of reverse osmosis systems in order to reduce plastic water bottle use.

CAP 4-1h

Consider increasing mandatory construction and demolition diversion rates beyond the rate required by State building codes.

CAP 4-1i

Work with community groups and Upper Valley Disposal Services to conduct outreach and educational campaigns for composting, recycling, and other waste reduction initiatives. Host educational events and produce regular educational mailings for residents.

A food waste collection program could allow residents to place food scraps in the green can for composting at Upper Valley Disposal Services' facilities.

CAP 4-1j

Review and revise the Town's franchise agreement with its waste hauler to ensure waste reduction and diversion rates are maximized. Conduct a formal rate structure study to support these efforts as warranted.

CAP 4-1k

Work with Upper Valley Disposal Services to conduct a waste audit of all residences and businesses to understand where opportunities for increased diversion lie.

CAP 4-1l

Continue to host the Town Wide Yard Sale in order to encourage reuse of items.

CAP 4-1m

Consider extending the ordinance to ban polystyrene food and drink carryout containers to include plastic containers. Encourage restaurants and retailers to provide compostable carryout containers.

RECOMMENDED GOVERNMENT OPERATIONS ACTIONS

CAP 4-2

Municipal Waste. Reduce waste sent to the landfill by composting organic materials, increasing recycling, reusing materials, and reducing consumption.

CAP 4-2a

Conduct a waste audit of all government facilities to understand where opportunities for increased diversion lie.

CAP 4-2b

Embark on an educational and incentive-based campaign to increase recycling and composting rates within government operations.

CAP 4-2c

Implement operational and purchasing policies to reduce paper use, such as requiring duplex printing, providing dishware and glassware to reduce use of disposable plates and cups, and online submission of applications and documents.

CAP 4-2d

Reduce waste by buying in bulk, purchasing articles with less packaging, and purchasing items in reusable containers.

The Town installed a water bottle refilling station at Vineyard Park to help reduce plastic bottle waste.

Natural Systems and Sequestration

The natural environment has been extensively altered by human civilization, often with little consideration for how natural systems function, depriving us of the important benefits they offer. Clearing and draining of wetlands, forestlands, grasslands and other open space for agricultural production or urban development decreases or eliminates the capacity of those natural systems to store carbon. The carbon dioxide stored in soil, trees and other vegetation is released into the atmosphere when forestland and open space is converted to other uses. Restoration of these natural areas, and establishment of new ones, has the potential to tie up or sequester greenhouse gas emissions in the form of soil and wood carbon. One way Yountville can sequester emissions is by encouraging tree planting in the community.

ACTIONS THE TOWN HAS ALREADY TAKEN

The Town has already taken the following actions to plant trees in public spaces and encourage tree planting in the community:

- Requires property owners to plant replacement trees whenever a tree removal permit is granted. If a replacement tree is not feasible, the property owner may pay an in-lieu fee to fund tree planting on public land.
- Is a Tree City USA community and plants at least one non-replacement tree per year in order to maintain its status.

Table 13: Natural Systems and Sequestration Strategies

STRATEGY	2020 GHG REDUCTIONS (METRIC TONS CO_2e)	2030 GHG REDUCTIONS (METRIC TONS CO_2e)
Community Actions		
5-1 Tree Planting on Private Land	1	1
Government Operations Actions		
5-2 Tree Planting on Public Land	<1	1
TOTAL GHG Reductions	**1***	**2***

*GHG reductions are reported for informational purposes only, as sequestration is not included in the Town's Greenhouse Gas Emissions Inventory.

RECOMMENDED COMMUNITY ACTIONS

CAP 5-1

Tree Planting on Private Land. Increase Yountville's tree cover.

CAP 5-1a

Require new development and significant remodeling projects to plant trees along street frontages or in front yard areas, wherever feasible.

CAP 5-1b

Require new and renovated parking lots to plant trees, wherever feasible.

CAP 5-1c

Require replacement of trees that are removed.

RECOMMENDED GOVERNMENT OPERATIONS ACTIONS

CAP 5-2

Tree Planting on Public Land. Increase the number of trees on Town land.

CAP 5-2a

Plant trees in Town parks, parking lots, medians and sidewalks, wherever feasible.

CAP 5-2b

Replace Town park and street trees that are removed, wherever feasible.

Street trees help to sequester carbon dioxide.

"HOW COULD I LOOK MY GRANDCHILDREN IN THE EYE AND SAY I KNEW ABOUT THIS -- AND I DID NOTHING?"

- SIR DAVID ATTENBOROUGH

IMPLEMENTATION OF THE CLIMATE ACTION PLAN

Yountville recognizes that responding to and preparing for climate change is a critical step toward a sustainable future. The Town's early actions to reduce its contribution to climate change reflect the Town's history and commitment to decrease the impacts of day-to-day activities on the natural environment while enhancing its vibrant quality of life. Mitigating climate change will require everyone — residents, businesses, government agencies, and nonprofit organizations — to work together to implement this plan.

This plan provides a strategy to achieve emission reductions that will achieve local levels consistent with State goals to reduce greenhouse gas emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030. A wide range of programs have been included in this plan to allow for the evaluation and prioritization of potential programs and capital improvement projects as new program and funding opportunities arise. Successful implementation of the plan will require staff and the Town Council to identify and commit resources to climate change mitigation activities, and to monitor and report on progress towards meeting emissions reduction goals.

RECOMMENDED ACTIONS

CAP 6-1

Annual Monitoring. Monitor and report on the Town's progress annually. Create an annual priorities list for implementation.

CAP 6-2

Update GHG Emissions Inventories. Update the greenhouse gas emissions inventory for community emissions annually and every five years for government operations.

CAP 6-3

Inter-Agency Coordination. Participate in public and private partnerships with Marin Clean Energy, PG&E, Napa County Energy Watch, Napa Valley Transportation Authority, Upper Valley Disposal Services, Yountville Elementary School, Sus-

tainable Napa County, the County of Napa and other organizations and public agencies that support implementation of the Climate Action Plan.

CAP 6-4

Funding Sources. Identify funding sources for recommended actions, and pursue local, regional, state and federal grants as appropriate.

CAP 6-5

Update the Climate Action Plan. Update the Climate Action Plan by the year 2020 to incorporate new long-term reduction targets and strategies to meet those targets.

Table 14: Implementation Plan for Reduction Strategies

ID	PROGRAM	LEAD DEPT	COST ESTIMATE	CIP	OPERATING BUDGET	OTHER FINANCING	ORDINANCE	STUDY /PLAN	INFRASTRUCTURE DEVELOPMENT OR PURCHASE	INTER-AGENCY COORDINATION	PUBLIC ED. & OUTREACH
Energy Efficiency and Renewable Energy											
1-1	Solar Energy	PB			X		X			X	
1-2	Residential Energy Efficiency	PB			X					X	X
1-3	Commercial Energy Efficiency	PB			X						
1-4	Residential Green Building Ordinance	PB			X		X				
1-5	Commercial Green Building Ordinance	PB			X		X				
1-6	Marin Clean Energy	PB			X					X	X
1-7	Public Lighting	PW			X				X	X	
1-8	Municipal Energy Efficiency Projects	PW	Completed.								
1-9	Municipal Energy Efficiency Protocols and Equipment	TM	$20 per desktop for energy management software; other equipment as replaced.	X					X		
1-10	Municipal Solar	PW	$954,000			X			X		

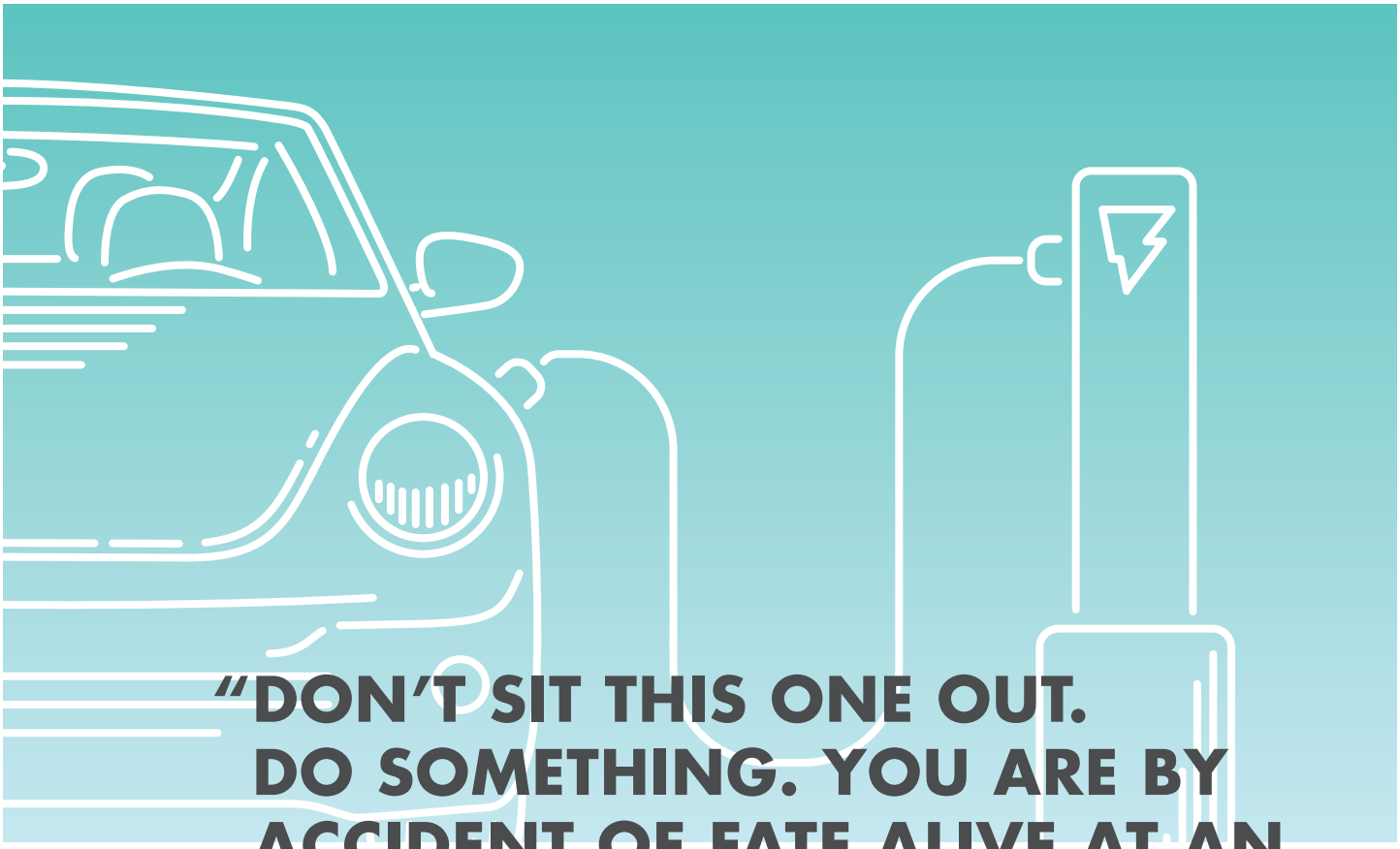
ID	PROGRAM	LEAD DEPT	COST ESTIMATE	CIP	OPERATING BUDGET	OTHER FINANCING	ORDINANCE	STUDY /PLAN	INFRASTRUCTURE DEVELOPMENT OR PURCHASE	INTER-AGENCY COORDINATION	PUBLIC ED. & OUTREACH
1-11	Municipal Electricity	TM	An additional 1 cent per KWh for MCE's Deep Green electricity, approximately $350 after all energy efficiency and renewable energy actions are implemented.		X				X		
Transportation											
2-1	Pedestrian Travel	PW		X	X				X		
2-2	Bicycle Travel	PB, PW		X	X		X		X	X	X
2-3	School Transportation	PW			X			X		X	
2-4	Public Transit	TM			X			X		X	X
2-5	Ridesharing	PB			X		X			X	X
2-6	Electric Vehicles	PB			X		X			X	
2-7	Vehicle Idling	TM			X		X				
2-8	Spare the Air Day Alerts	TM			X						X
2-9	Leaf Blowers	TM			X		X				
2-10	Low Emission Town Vehicles	PW	Cost premiums and years to payback vary with model. For cost comparisons, see fueleconomy.com	X					X		
2-11	Town Employee Commute	TM			X			X			
2-12	Town Leaf Blowers	PW			X			X			
Water and Wastewater											
3-1	Indoor Water Use	PB, TM			X					X	X
3-2	Outdoor Water Use	PB, TM			X					X	X
3-3	Rainwater Catchment	PB, TM			X		X				X
3-4	Greywater Systems	PB, TM			X		X				X
3-5	Wastewater Treatment	PW		X	X				X		
3-6	Water-Efficient Landscaping	PW		X					X		

ID	PROGRAM	LEAD DEPT	COST ESTIMATE	CIP	OPERATING BUDGET	OTHER FINANCING	ORDINANCE	STUDY /PLAN	INFRASTRUCTURE DEVELOPMENT OR PURCHASE	INTER-AGENCY COORDINATION	PUBLIC ED. & OUTREACH
Waste											
4-1	Community Waste	PB, PW, TM		X	X	X	X	X	X	X	X
4-2	Municipal Waste	TM			X			X			
Natural Systems											
5-1	Tree Planting on Private Land	PB			X						X
5-2	Tree Planting on Public Land	PW		X					X		
Implementation											
6-1	Annual Monitoring	TM			X			X			
6-2	Update GHG Emissions Inventories	TM	$10,000 - $15,000 every five years	X	X			X			
6-3	Inter-Agency Coordination	TM			X					X	
6-4	Funding Sources	TM				X					
6-5	Update the Climate Action Plan	TM	$50,000 - $75,000	X				X			

KEY

PB : Planning & Building Department
PW : Public Works Department
TM : Town Manager's Office

APPENDIX



"DON'T SIT THIS ONE OUT. DO SOMETHING. YOU ARE BY ACCIDENT OF FATE ALIVE AT AN ABSOLUTE CRITICAL MOMENT IN THE HISTORY OF OUR PLANET."

- CARL SAGAN

SOLAR ENERGY *Community Action 1-1*	
Action	Encourage residents and business to install solar energy systems.
Reductions ($MTCO_2e$) -273.3 -168.2	 2020 2030
Methodology and Assumptions	Calculation assumes 13.7% PV market penetration by 2020 based on 2014 annual growth rates of 36% for residential systems and 12% for non-residential systems. PV residential market penetration is estimated at 3.5% in April 2016, and non-residential penetration at 8.2%. The estimate of PV to be installed is restricted to installations on existing homes and commercial properties, excluding government facilities.
Sources	Solar Electric Power Association, "Utility Solar Market Snapshot: Sustained Growth in 2014," May 2015, https://www.solarelectricpower.org/media/322918/solar-market- California Solar Statistics, "Currently Interconnected Data Set," April 30, 2016

Calculation

	2020	2030
Community electricity consumption (kWh), excluding new development (2013)	18,830,879 kWh	19,358,773 kWh
Less government operations electricity	717,617 kWh	717,617 kWh
Net community electricity consumption	18,113,262 kWh	18,641,156 kWh
Percent kWh generated by renewable systems	13.7%	20.0% kWh
kWh produced by renewable systems	2,480,611 kWh	3,728,231 kWh
GHG emissions reductions	273.3 $MTCO_2e$	168.2 $MTCO_2e$

Growth Rate Calculation

Estimated residential PV generation, 2016	222,876
Estimated residential electricity consumption including PV generation, 2010	6,459,526
Estimated residential market penetration, 2016	3.5%
Annual growth rate	36.0%
Projected generation, 2020	889,177
Projected market penetration, 2020	13.8%
Non-residential PV generation, 2016	912,126
Estimated non-residential elec. consumption including PV generation, 2010	11,124,265
Estimated non-residential market penetration, 2016	8.2%
Annual growth rate, 2014	12.0%
Projected generation, 2020	1,518,924
Projected market penetration, 2020	13.7%
Projected market penetration, res. and non-res.combined, 2020	13.7%

RESIDENTIAL ENERGY EFFICIENCY

Community Action 1-2

Action	Promote and encourage resident and business owner participation in energy efficiency rebates and incentive programs offered by organizations such as the Napa County Energy Watch, PG&E and Marin Clean Energy.
Reductions ($MTCO_2e$) -329.6 -576.0	 2020 2030
Methodology and Assumptions	We are forecasting an annual energy efficiency savings of 1% based on the following: The National Action Plan for Energy Efficiency states among its key findings "consistently funded, well-designed programs are cutting annual savings for a given program year of 0.15 to 1 percent of energy sales." The American Council for an Energy-Efficiency Economy (ACEE) reports for states already operating substantial energy efficiency programs, energy efficiency goals of one percent, as a percentage of energy sales, is a reasonable level to target. Marin Clean Energy's Implementation Plan states "MCE's goal is to increase annual savings through energy efficiency programs to two percent (combined MCE and PG&E programs) of annualized electric sales…by the end of 2018." Energy efficiency savings are attributed to baseline 2010 energy use as new construction is subject to Title 24 energy efficiency requirements.
Sources	Marin Clean Energy Revised Community Choice Aggregation Implementation Plan and Statement of Intent, July 18, 2014. National Action Plan for Energy Efficiency, July 2006, Section 6: Energy Efficiency Program Best Practices (pages 5-6). Energy Efficiency Resource Standards: Experience and Recommendations, Steve Nadel, March 2006 ACEEE Report E063 (pages 28-30).

Calculation

	2020	2030
Residential electricity use, 2010	6,401,515 kWh	6,401,515 kWh
Residential electricity savings	640,152 kWh	1,280,303 kWh
Residential natural gas use, 2010	487,477 therms	487,477 therms
Residential natural gas savings	48,748 therms	97,495 therms
GHG emissions reductions	329.6 $MTCO_2e$	576.0 $MTCO_2e$

COMMERCIAL ENERGY EFFICIENCY *Community Action 1-3*	
Action	Promote commercial energy efficiency and demand response programs provided through Napa County Energy Watch, PG&E and Marin Clean Energy.
Reductions ($MTCO_2e$) -420.3 -699.7	 2020 2030
Methodology and Assumptions	We are forecasting an annual energy efficiency savings of 1% based on the following: The National Action Plan for Energy Efficiency states among its key findings "consistently funded, well-designed programs are cutting annual savings for a given program year of 0.15 to 1 percent of energy sales." The American Council for an Energy-Efficiency Economy (ACEE) reports for states already operating substantial energy efficiency programs, energy efficiency goals of one percent, as a percentage of energy sales, is a reasonable level to target. Marin Clean Energy's Implementation Plan states "MCE's goal is to increase annual savings through energy efficiency programs to two percent (combined MCE and PG&E programs) of annualized electric sales…by the end of 2018." Energy efficiency savings are attributed to baseline 2010 energy use only as new construction is subject to Title 24 energy efficiency requirements.
Sources	Marin Clean Energy Revised Community Choice Aggregation Implementation Plan and Statement of Intent, July 18, 2014. National Action Plan for Energy Efficiency, July 2006, Section 6: Energy Efficiency Program Best Practices (pages 5-6). Energy Efficiency Resource Standards: Experience and Recommendations, Steve Nadel, March 2006 ACEEE Report E063 (pages 28-30).

Calculation

	2020	2030
Commercial electricity use, 2010	10,825,603 kWh	10,825,603 kWh
Commercial electricity savings	1,082,560 kWh	2,165,121 kWh
Commercial natural gas use, 2010	566,245 therms	566,245 therms
Commercial natural gas savings	56,625 therms	113,249 therms
GHG emissions reductions	420.3 $MTCO_2e$	699.7 $MTCO_2e$

RESIDENTIAL GREEN BUILDING ORDINANCE *Community Action 1-4*	
Action	Update building codes to mandate higher building energy performance in newly constructed residential buildings and additions.
Reductions ($MTCO_2e$) -18.0 -23.6	 2020 2030
Methodology and Assumptions	CAPCOA Measure BE-1 used for estimating building energy savings. For additions, assumed an average of 12 residential projects per year (approximately 780 square feet of conditioned space total). Assumed 1,800 square feet per residential building (2011 American Housing Survey for owner-occupied units in San Francisco-San Mateo-Redwood City AHS Area). CALGreen Tier 1 currently requires 15% reduction in the energy budget for new residential. Assumed requirements for residential additions are 5% reduction for projects involving one new mechanical systems and a 10% reduction for projects involving two or more new mechanical systems, as proposed for the 2016 CALGreen update. Space heating systems, space cooling systems, and water heating systems are each separate mechanical systems. Assumed an equal percentage of both project types. All new residential buildings (single family and low-rise multifamily 3 stories or less) are assumed to be zero net energy as of 2020 and are separately quantified as a State Action.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. California Building Standards Commission, 2013 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11 2011 American Housing Survey, Table C-02-OO-M

Calculation

Residential	**2020**	**2030**
Percent over Title 24 Energy Requirements	15 %	15 %
Percent of participating new residential units	100%	100%
New construction electricity use, BAU	354,810 kWh	354,810 kWh
New construction electricity use, after Title 24	223,037 kWh	223,037 kWh
Additional reduction in electricity use	3,542 kWh	3,542 kWh
New construction natural gas use, BAU	27,019 therms	27,019 therms
New construction natural gas use, after Title 24	19,775 therms	19,775 therms
Additional reduction in natural gas use	2,652 therms	2,106 therms
GHG emissions reductions	14.5 $MTCO_2e$	11.4 $MTCO_2e$

Residential: Additions and Remodels	**2020**	**2030**
Percent over Title 24 Energy Requirements	7.5 %	7.5 %
Number of projects per year requiring new or modified mechanical systems	12	12
Annual expanded space per year	9,360 sq. ft.	9,360 sq. ft.
Total expanded space	37,440 sq. ft.	131,040 sq. ft.
Electricity use, BAU	126,811 kWh	443,838 kWh
Reduction in electricity use	1,007 KWh	3,525 KWh
Natural gas use, BAU	9,657 therms	33,798 therms
Reduction in natural gas use	648 therms	2,266 therms
GHG emissions reductions	3.6 $MTCO_2e$	12.2 $MTCO_2e$

COMMERCIAL GREEN BUILDING ORDINANCE *Community Action 1-5*	
Action	Update building codes to mandate higher building energy performance in newly constructed non-residential buildings and additions.
Reductions ($MTCO_2e$) -29.4 -45.5	 2020 2030
Methodology and Assumptions	CAPCOA Measure BE-1 used for estimating building energy savings. For remodels and additions, assumed 3 non-residential projects per year with an average of 5,000 square feet for each project. CALGreen Tier 1 currently requires 5% reduction in the energy budget for projects that include indoor lighting or mechanical systems, but not both, and 10% reduction for projects that include both indoor lighting and mechanical systems. Assumed an equal percentage of both project types. Assumed 13.3 kWh per square foot and 0.357 therms per square foot.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. California Building Standards Commission, 2013 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11 U.S. Energy Information Administration, Office of Energy Markets and End Use, 2012 Commercial Buildings Energy Consumption Survey, Tables C19 and C29, Pacific Census division.

Commercial	**2020**	**2030**
Percent over Title 24 Energy Requirements	10 %	10 %
Percent of participating new commercial space	100%	100%
New construction electricity use, BAU	1,420,860 kWh	1,826,821 kWh
New construction electricity use, after Title 24	1,065,226 kWh	1,193,594 kWh
Additional reduction in electricity use	28,761 kWh	32,227 kWh
New construction natural gas use, BAU	74,320 therms	95,554 therms
New construction natural gas use, after Title 24	53,081 therms	59,478 therms
Additional reduction in natural gas use	3,769 therms	4,223 therms
GHG emissions reductions	23.2 MTCO2e	23.9 MTCO2e

Commercial: Remodels and Additions	**2020**	**2030**
Percent over Title 24 Energy Requirements	7.5 %	7.5 %
Number of projects per year	3	3
Average square feet remodeled per project	5,000	5,000
Total remodeled/expanded space	60,000 sq. ft.	210,000 sq. ft.
Electricity use, BAU	798,000 kWh	2,793,000 kWh
Reduction in	16,160 KWh	56,558 KWh
Natural gas use, BAU	19,200 therms	67,200 therms
Reduction in natural gas use	1,022 therms	3,578 therms
GHG emissions reductions	6.2 $MTCO_2e$	21.6 $MTCO_2e$

MARIN CLEAN ENERGY *Community Action 1-6*	
Action	Encourage Marin Clean Energy to reach its goal to provide Light Green power content that is 95 percent GHG-free by 2025. Encourage homeowners and businesses to purchase Marin Clean Energy's Deep Green 100 percent renewable electricity.
Reductions ($MTCO_2e$) -385.5 -1,372.8	 2020 2030
Methodology and Assumptions	Based on the Marin Clean Energy 2015 Integrated Resource Plan, MCE's GHG-free volumes are expected to be 76% by 2020 and 95% by 2030. We have conservatively estimated a future GHG emission factor by assuming the remainder will be system power using the current emission factor set by CARB of 943.57736 lbs CO2/MWh, yielding future emission factors of 226.46 lbs CO2/MWh in 2020 and 47.18 lbs CO2/MWh in 2030. Approximately 1.9% of MCE's customers purchase Deep Green electricity. Based on this data, we are projecting a similar baseline Deep Green rate in Yountville. A targeted campaign would seek to double this rate by 2020, which would be equivalent to converting approximately 48 households to Deep Green.
Sources	Marin Clean Energy, 2015 Integrated Resource Plan (October 2015). https://www.mcecleanenergy.org/wp-content/uploads/2016/01/Marin-Clean-Energy-2015-Integrated-Resource-Plan_FINAL-BOARD-APPROVED.pdf Personal communication, Justin Kudo, MCE Manager of Account Services, jkudo@marinenergyauthority.org, July 14 and 15, 2016.

Calculation

	2020	2030
Electricity use, BAU	18,830,879 kWh	19,358,773 kWh
Electricity saved through State actions	2,785,790 kWh	3,211,306 kWh
electricity	717,617 kWh	717,617 kWh
Net electricity use	15,327,472 kWh	15,429,850 kWh
Projected MCE electricity use (80% of total)	12,261,977 kWh	12,343,880 kWh
Electricity emissions w/RPS	1,634 MTCO2e	1,645 MTCO2e
Electricity emissions w/MCE	1,280 MTCO2e	285 MTCO2e
GHG emission reductions	353.4 MTCO2e	1,359.6 MTCO2e

Net electricity use	15,327,472 kWh	15,429,850 kWh
Baseline Deep Green participation rate	1.9%	1.9%
Baseline Deep Green load	291,222 kWh	293,167 kWh
Campaign target	291,222 kWh	293,167 kWh
GHG emission reductions	32.1 MTCO2e	13.2 MTCO2e

PUBLIC LIGHTING *Government Operations Action 1-7*	
Action	Replace all streetlights and park lighting with energy-efficient LED lighting.
Reductions ($MTCO_2e$) -9.5 -9.5	 2020 2030
Methodology and Assumptions	200 of the Town's 284 streetlights have been converted to LED. The measure assumes the remaining 84 streetlights, which are owned and/or maintained by PG&E, will be converted to LED by 2020. Electricity consumed by PG&E streetlights was included as an information item in the Town's 2010 LGO Emissions Inventory. Therefore, the action is identified as a community action, and not a government operations action. Savings are based on LED streetlights conversion projects for similar towns in Marin County.
Sources	Town of Yountville Public Works Department.

Calculation

Electricity consumption for public lighting, 2010	99,403 kWh
Potential electricity reduction through LED replacement	47%
Electricity savings	46,719 kWh
GHG emissions reductions	9.5 $MTCO_2e$

MUNICIPAL ENERGY EFFICIENCY PROJECTS

Government Operations Action 1-8

Action	Identify and complete energy-efficiency projects.
Reductions ($MTCO_2e$) -23.6 -23.6	 2020 2030
Methodology and Assumptions	HVAC and lighting improvements, including motion sensors, were completed at the Town Hall and the Community Center. The Public Works building was insulated. At the Wastewater Treatment Plant, aeration blowers were modified to be more energy efficient and six motors were replaced with energy-efficient models.
Sources	QuEST, Inc., "California Wastewater Porocess Optimization Program Pre-Installation Facility Audit Report Town of Yountville Wastewater Treatment Facility," December 6, 2010. Beutler Mechanical Energy Services Proposal, December 17, 2009. Town of Yountville EECBG Application Feasibility Study, Exhibit 3. Town of Yountville, "ICLEI Final Master Data Workbook for LocalGovernment Operations Emissions Inventory," Dec. 12, 2013.

Calculation

Project	Annual Electricity Savings (kWh)	Annual Natural Gas Savings (therms)
Aeration Blowers at the Wastewater Treatment Plant	58,000	
Town Hall/Community Center HVAC	2,890	118
Town Hall Lighting Retrofit	8,712	
Community Center Lighting Retrofit	13,107	
Post Office Lighting Retrofit and Package HVAC Unit	6,678	
Corporation Yard insulation		462
Wastewater Treatment Plant Hot Water Heater	2,784	-82
Wastewater Treatment Plant Trickling Filter Motor Replacement	10,711	
Total savings	102,882	498
Emissions reductions ($MTCO_2e$) 2020	20.9	2.6

MUNICIPAL ENERGY EFFICIENCY PROTOCOLS AND EQUIPMENT *Community Action 1-9*	
Action	Install energy management software and implement energy efficiency protocols such as turning off computers when not in use and reducing energy use through thermostat control. Implement a sustainable purchasing policy that emphasizes recycled materials and Energy Star-certified appliances and office equipment.
Reductions ($MTCO_2e$) -2.7 -2.7	 2020 2030
Methodology and Assumptions	Energy management software is proven to reduce energy consumption by 10% through identifying inefficiencies within operations. A 5% reduction in energy use for miscellaneous behavioral changes by staff and mechanical operations, and upgrading to Energy Star equipment was assumed.
Sources	

Calculation

Electricity consumption in municipal buildings, 2010	235,887 kWh
Electricity use in municipal buildings	48 MTCO2e
Natural gas use in municipal buildings	7 MTCO2e
Percent reduction in energy use	5%
Reduction in electricity consumption	11,794 kWh
GHG emissions reductions	2.7 MTCO2e

MUNICIPAL SOLAR ENERGY *Government Operations Action 1-10*	
Action	Install solar energy projects at identified Town facilities .
Reductions ($MTCO_2e$) -104.8 -104.8	 2020 2030
Methodology and Assumptions	The Town is installing three solar energy systems in 2016: a 217.3 kW DC ground-mount system at the Wastewater Treatment Plant; a 36.0 kW DC ground-mount system at the Pump Station; and a 95.4 kW DC carport structure at the Community Center, for a total of 348.7 kW and estimated total system output of 514,869 kWh.
Sources	SolEd Benefit Corporation, Solar PV Energy Cost and Savings Analysis prepared for the March 1, 2016 Town Council meeting

Calculation

Electricity estimated to be generated at WWTP	328,449 kWh
Electricity estimated to be generated at Pump Station	50,904 kWh
Electricity estimated to be generated at Community Center	135,516 kWh
Total electricity savings	514,869 kWh
GHG emissions reductions	104.8 $MTCO_2e$

MUNICIPAL MARIN CLEAN ENERGY *Government Operations Action 1-11*	
Action	Purchase Marin Clean Energy Deep Green electricity for all Town facilities.
Reductions ($MTCO_2e$) -8.5 -8.5	 2020 2030
Methodology and Assumptions	Calculation assumes electricity consumption is reduced through all other measures first. Marin Clean Energy's Deep Green electricity is 100% renewable and 100% greenhouse gas free.
Sources	Marin Clean Energy

Calculation

	2020	2030
Government operations electricity emissions in 2010	146.1 $MTCO_2e$	146.1 $MTCO_2e$
Electricity emissions reduced through other measures	137.6 $MTCO_2e$	137.6 $MTCO_2e$
Reduction in GHG emissions	8.5 $MTCO_2e$	8.5 $MTCO_2e$

PEDESTRIAN TRAVEL *Community Action 2-1*	
Action	Encourage walking as an alternative to vehicular travel.
Reductions ($MTCO_2e$) -17.3 -24.9	 2020 2030
Methodology and Assumptions	Studies cited by CAPCOA show pedestrian network improvements can reduce VMT 1-2% (CAPCOA SDT-1).
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2020	2030
Local VMT	4,095,592 VMT	3,986,156 VMT
% decrease in VMT due to pedestrian improvements	1.0%	2.0%
Annual decrease in VMT	40,956 VMT	79,723 VMT
GHG emissions reductions	17.3 $MTCO_2e$	24.9 $MTCO_2e$

BICYCLE TRAVEL *Community Action 2-2*	
Action	Encourage biking as an alternative to vehicular travel.
Reductions ($MTCO_2e$) -20.8 -14.9	 2020 2030
Methodology and Assumptions	Studies cited by CAPCOA show each additional mile of bike lanes per square mile increases the share of workers commuting by bicycle by 1% (CAPCOA SDT-5). We have assumed a similar reduction for general local transportation. Approximately 1.2 miles of the 47-mile Napa Valley Vine Trail will pass through Yountville. The Vine Trail will ultimately connect Calistoga to the Vallejo ferry terminal, and will be utilized by visitors, residents, and commuters.
Sources	2010 U.S. Census, SF1:DP-1. California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2020	2030
Annual local VMT, BAU	4,095,592 VMT	3,986,156 VMT
Additional bike lanes	1.2 miles	1.2 miles
Reduction in local VMT	49,147 VMT	47,834 VMT
Emissions reductions	20.8 $MTCO_2e$	14.9 $MTCO_2e$

SCHOOL TRANSPORTATION *Community Action 2-3*	
Action	Encourage bicycling, walking, carpooling, and taking public transit to school.
Reductions ($MTCO_2e$) -3.9 -3.3	 2020 2030
Methodology and Assumptions	Average trip length was determined by modeling trip lengths to Yountville Elementary school and Town limits. Estimated 187 school-aged children residing Yountville in 2010 (based on 2010 U.S. Census). 180 days in a school year. To demonstrate the benefits of providing Safe Routes to Schools, the Marin County Bicycle Coalition recruited nine pilot schools in four different geographic locations. Initial surveys reported that 62% of the students were arriving by car, with only 14% walking, 7% biking to school, 11% carpool, and 6% arriving by bus. Every school in the pilot program held periodic Walk and Bike to School Days and participated in the Frequent Rider Miles contest, which rewarded children who came to school walking, biking, by carpool or bus. At the end of the pilot program, the participating schools experienced a 57% increase in the number of children walking and biking and a 29%
Sources	Trip lengths modeled with Google Maps, maps.google.com. Safe Routes to School Marin County, http://www.saferoutestoschools.org/history.html#success

Calculation

	2020	2030
Average trip length	0.7 mile	0.7 mile
Number of students	203 students	231 students
Number students estimated to drive to school	126 students	143 students
Potential decrease in students driving to school	36 students	41 students
VMT avoided	9,179 VMT	10,446 VMT
Emissions reductions	3.9 $MTCO_2e$	3.3 $MTCO_2e$

PUBLIC TRANSIT *Community Action 2-4*	
Action	Support and promote public transit.
Reductions ($MTCO_2e$) -5.3 -5.5	 2020 2030
Methodology and Assumptions	The VINE transit system is operated by the Napa Valley Transportation Authority (NVTA). In 2012, NVTA redesigned the Vine system to better meet the needs of the community and transit riders. Ridership changed between 2010 and 2015 as follows: Vine Transit: 407,336 in 2010 and 824,383 in 2015, a 202% increase. Yountville Trolley: 25,541 in 2010 and 23,516 in 2015, an 8% decrease. Combined, this is a 196% increase over 2010 ridership. We have assumed a 2% annual growth in ridership for years 2016 through 2030. Average trip length was determined by modeling trip lengths between the Yountville town limits.
Sources	Personal communication with Matthew Wilcox, Transit Manager, Napa Valley Transportation Authority, July 20, 2016. Napa Valley Transportation Authority Annual Report 2015, http://www.nvta.ca.gov/sites/default/files/2015%20Annual%20Report.pdf Trip lengths modeled with Google Maps, maps.google.com.

Calculation

	2020	2030
Transit rides originating or ending in Yountville, 2015	30,000 rides	30,000 rides
Increase in rides since 2010	14,694 rides	14,694 rides
Projected increase in rides from 2015	3,121 rides	10,375 rides
Average trip length in Yountville	0.7 miles	0.7 miles
VMT avoided	12,471 VMT	17,548 VMT
Emissions reductions	5.3 $MTCO_2e$	5.5 $MTCO_2e$

RIDESHARING *Community Action 2-5*	
Action	Support and promote ridesharing programs.
($MTCO_2e$) -7.2 -11.0	 2020 2030
Methodology and Assumptions	Napa Valley Transportation Authority provides a variety of transportation demand reduction programs for local employees, including rideshare matching programs, vanpool incentive programs and emergency ride home CAPCOA Measure TRT-1. Assuming a suburban center and 100% of employees are eligible for incentives, VMT reduction is 5.4%. Measure assumes the employer support program will include carpooling, ride-matching, and vanpool assistance. VMT reductions were calculated assuming 250 workdays per year. Average trip length was determined by modeling trip lengths from Yountville town limits to various points in Yountville.
Sources	2010 American Community Survey, 5-Year Estimates. California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Trip lengths modeled with Google Maps, maps.google.com.

Calculation

	2020	2030
Workers in Yountville	1,810 people	1,870 people
Percent employees targeted	50.0%	100.0%
Average trip length	0.7 miles	0.7 miles
Rate of participation in TDM programs	5.4%	5.4%
VMT avoided	17,105 VMT	35,343 VMT
Emissions reductions	7.2 $MTCO_2e$	11.0 $MTCO_2e$

ELECTRIC VEHICLES *Community Action 2-6*	
Action	Increase ownership of electric vehicles.
Reductions ($MTCO_2e$) -7.9 -30.5	Implementation options: 2020 2030
Methodology and Assumptions	Average trip length was determined by modeling trip lengths from town limits to employment centers. Each parking space was assumed to be associated with two round trip EV vehicle trips per day. Assumes electric vehicle efficiency of .32 kWh/mile, based on the Nissan Leaf fuel economy for city driving.
Sources	Trip lengths modeled with Google Maps, maps.google.com. Electric vehicle fuel economy from www.fueleconomy.gov.

Calculation

	2020	2030
Average trip length (miles)	0.70 mile	0.70 mile
Annual miles per parking space	1,023 miles	1,023 miles
Annual emissions per parking space	0.43 $MTCO_2e$	0.32 $MTCO_2e$
Annual electricity use per parking space	327 kWh	327 kWh
Electric vehicle emissions per parking space	0.04 $MTCO_2e$	0.01 $MTCO_2e$
Emissions reductions per parking space	0.40 $MTCO_2e$	0.30 $MTCO_2e$
Number of EV charging spaces	20 spaces	100 spaces
Emissions reductions	7.9 $MTCO_2e$	30.5 $MTCO_2e$

VEHICLE IDLING *Community Action 2-7*	
Action	Consider adopting an ordinance to prohibit commercial vehicle idling, including hired limousines, for periods longer than five minutes.
Reductions ($MTCO_2e$) -2.5 -2.5	 2020 2030
Methodology and Assumptions	Limousines: A full-size sedan burns 0.39 gallons/hour with no load and 0.59 gallons/hour with load (e.g., air conditioning, radio, and other electronic equipment). We assumed 50% of each use. We assumed 15 minutes of idling time per vehicle, and the following traffic: January through March: 9 vehicles weekly April through August: 45 vehicles weekly September through October: 60 vehicles weekly November through December: 15 vehicles weekly Vehicles over 10,000 lbs. are prohibited by State law from idling for more than 5 minutes and are excluded from this analysis.
Sources	Nathan Steele, Management Analyst, Town of Yountville. Argonne National Laboratory, Vehicle Idle Reduction Savings Worksheet, http://www.anl.gov/energy-systems/downloads/vehicle-idle-reduction-savings-worksheet, accessed July 2016.

Calculation

	2020	2030
Limousine population targeted	1,743 vehicles	1,743 vehicles
Hours per year of vehicle idling	581 hours	581 hours
Gasoline burned per hour	0.49 gal/hr	0.49 gal/hr
Fuel consumed in vehicle idling	285 gallons	285 gallons
Total emissions reductions	2 $MTCO_2e$	2 $MTCO_2e$

SPARE THE AIR ALERTS *Community Action 2-8*	
Action	Assist the Bay Area Air Quality District in promoting Spare the Air Day alerts. Add a Spare the Air Alert Status widget to the Town's website and provide information to community members on how they can register for Spare the Air Day alerts.
Reductions ($MTCO_2e$) -2.0 -2.0	Implementation options: 2020 2030
Methodology and Assumptions	The Bay Area Air Quality Management District reports there are 15-20 Spare the Air alerts each winter. The winter Spare the Air season runs from November through February, or approximately 120 days. We assume 17.5 Spare the Air alert days, and that emissions are evenly distributed among all winter days. We assume that that 50% of residents currently comply with the Spare the Air Day alerts and the Town's efforts double the compliance rate.
Sources	Bay Area Air Quality Management District Spare the Air website, accessed July 2016, http://www.sparetheair.org/make-a-difference/get-the-facts.

Calculation

	2020	2030
Residential wood burning emissions	26.9 $MTCO_2e$	27.4 $MTCO_2e$
Spare the Air Day emissions avoided	3.9 $MTCO_2e$	4.0 $MTCO_2e$
Emissions reductions	2.0 $MTCO_2e$	2.0 $MTCO_2e$

LEAF BLOWERS *Community Action 2-9*	
Action	Adopt an ordinance to ban or regulate the use of gas leaf blowers. At a minimum, encourage the use of electric leaf blowers instead of gasoline-powered leaf blowers.
Reductions ($MTCO_2e$) -2.4 -2.7	 2020 2030
Methodology and Assumptions	Assumes all gasoline and diesel-powered leaf blowers are banned.
Sources	OFFROAD 2007 for Napa County.

Calculation

	2020	2030
Emissions from leaf blowers	2.4 $MTCO_2e$	2.7 $MTCO_2e$

LOW-EMMISION TOWN VEHICLES *Government Operations Action 2-10*	
Action	Purchase or lease low or zero-emissions vehicles and the most fuel-efficient models for the Town fleet whenever feasible.
Reductions ($MTCO_2e$) -3.5 -9.9	 2020 2030
Methodology and Assumptions	The Town's vehicle fleet consists of two electric cars, a van, and several pick-up trucks and heavy duty vehicles. As vehicles are replaced, there will be opportunities to improve vehicle fuel efficiency with similar models. We have assumed the same rate of emissions reduction as calculated by EMFAC for Napa County on-road vehicles.
Sources	Town of Yountville Public Works Department

Calculation

	2020	2030
Annual VMT for Town on-road vehicles, 2010	46,159 VMT	46,159 VMT
2010 GHG emissions for Town on-road emissions, 2010	28 $MTCO_2e$	28 $MTCO_2e$
Estimated emission reduction from 2010	12.7%	35.5%
Emissions reductions	3.5 $MTCO_2e$	9.9 $MTCO_2e$

TOWN EMPLOYEE COMMUTE *Government Operations Action 2-11*	
Action	Provide Town employees with incentives to use alternatives to single occupant auto commuting, such as transit subsidies, bicycle facilities, ridesharing services, flexible schedules, and telecommuting when practical. Provide incentives to commute in electric vehicles, such as free EV charging.
Reductions ($MTCO_2e$) -2.7 -2.7	 2020 2030
Methodology and Assumptions	CAPCOA Measure TRT-1. Assuming a low density suburb and 100% of employees are eligible for incentives, VMT reduction is 5.2%.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2020	2030
Employee commute VMT, BAU	111,457 VMT	111,457 VMT
Reduction in VMT	5.2%	5.2%
VMT avoided	5,796 VMT	5,796 VMT
Emissions reduction	2.7 MTCO2e	2.7 MTCO2e

TOWN LEAF BLOWERS *Government Operatrions Action 2-12*	
Action	Consider replacing gasoline-powered leaf blowers with electric or battery-operated leaf blowers as technology advancements make these alternatives more attractive.
Reductions ($MTCO_2e$) -0.2 -0.2	 2020 2030
Methodology and Assumptions	Assumes all gasoline and diesel-powered leaf blowers are replaced.
Sources	Town of Yountville Local Government Operations Inventory Master Data Workbook

Calculation

	2020	2030
Gasoline used for leafblowers	27.5 gallons	27.5 gallons
Emissions from leaf blowers	0.2 $MTCO_2e$	0.2 $MTCO_2e$

INDOOR WATER USE *Community Action 3-1*	
Action	Reduce indoor water use in residential and commercial buildings.
Reductions ($MTCO_2e$) -150.4 -82.6	 2020 2030
Methodology and Assumptions	We assume 41% of residential water consumption is for indoor use, and 33.2% of indoor water use is hot water (AWWA Research Foundation) We assume 82% of commercial water use is for indoor use and 39% of indoor water use is hot water, based on EPA estimates of end uses of water by commercial subsectors. We assume 40% of commercial buildings use natural gas to heat water, based on the 2012 Commercial Buildings Energy Consumption Survey. The Pacific Institute has found a potential of 33 gallons per capita per day by retrofitting homes with the latest models of water-efficient appliances and fixtures and eliminating water loss from leaky pipes and fixtures. Potential savings for fixtures that use hot water (faucets, showers, clothes washers, and dishwashers) are 15.2 gallons per capita per day. Approximately 8.1 gallons are hot water. The Pacific Institute estimates commercial water use can be reduced by 30 to 50 percent. Similar to energy efficiency programs, we assume an annual water efficiency savings of 1% due to water efficiency programs. This measure applies water savings to existing homes and commercial buildings only, as new buildings are required to install water-efficient fixtures. The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer and 1,911 kWh/MG to treat wastewater in northern California.
Sources	AWWA Research Foundation, "Residential End Uses of Water," 1999, http://www.waterrf.org/publicreportlibrary/rfr90781_1999_241a.pdf EPA WaterSense, "Water Efficiency in the Commercial and Institutional Sector: Considerations for a WaterSense Program," August 20, 2009, https://www3.epa.gov/watersense/docs/ci_whitepaper.pdf Water Research Foundation, "Residential End Uses of Water, Version 2 Executive Report," 2016, http://www.waterrf.org/PublicReportLibrary/4309A.pdf Pacific Institute, "Urban Water Conservation and Efficiency Potential in California," June 2014, http://pacinst.org/app/uploads/2014/06/ca-water-urban.pdf ICLEI Climate and Air Pollution Planning Assistant - CAPPA V1.5

Sources (con't.)	U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey, 2012, Table B31, http://www.eia.gov/consumption/commercial/data/2012/bc/cfm/b31.cfm Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006 Town of Yountville water consumption by service rate for 2010.

Calculation

Residential Indoor Water Use	**2020**	**2030**
Population, 2010	2,005 people	2,005 people
Potential annual water savings	24,150,225 gallons	24,150,225 gallons
Percent of homes installing water-efficient fixtures	10%	20%
Indoor water consumption reduction	2,415,023 gallons	4,830,045 gallons
Water and wastewater-related electricity saved	13,068 kWh	26,135 kWh
Indoor hot water consumption reduction	590,949 gallons	1,181,897 gallons
Natural gas required to heat one gallon of water	0.0098 therms	0.0098 therms
Electricity required to heat one gallon of water	0.19 kWh	0.19 kWh
Percent water heaters that use natural gas	58%	58%
Therms saved	3,359 therms	6,718 therms
Electricity saved	47,158 kWh	94,315 kWh
GHG emissions reduction	24.5 $MTCO_2e$	41.1 $MTCO_2e$

Commercial Indoor Water Use	**2020**	**2030**
Commercial water use, 2010	112,919,040 gallons	112,919,040 gallons
Estimated indoor water use	92,840,998 gallons	20,078,042 gallons
Indoor water consumption reduction	10%	20%
Indoor water consumption reduction	9,284,100 gallons	4,015,608 gallons
Water and wastewater-related electricity saved	50,236 kWh	21,728 kWh
Indoor hot water consumption reduction	3,603,419 gallons	1,558,570 gallons
Natural gas required to heat one gallon of water	0.0098 therms	0.0098 therms
Electricity required to heat one gallon of water	0.19 kWh	0.19 kWh
Percent natural gas water heating	40%	40%
Therms saved	14,125 therms	6,110 therms
Electricity saved	410,790 kWh	177,677 kWh
GHG emissions reduction	125.9 $MTCO_2e$	41.5 $MTCO_2e$

OUTDOOR WATER USE *Community Action 3-2*	
Action	Reduce outdoor water use.
Reductions ($MTCO_2e$) -10.6 -6.5	 2020 2030
Methodology and Assumptions	We assume 59% of residential water consumption is for outdoor use in (American Water Works Association) We assume 18% of commercial water use is for outdoor use (EPA). The Pacific Institute estimates moderate landscape conversions could reduce outdoor water use by 30%, while more extensive conversions could reduce outdoor use by 70%. CAPCOA also estimates water-efficient landscapes can reduce outdoor water use by up to 70% (CAPCOA Measure WUW-3). The Water Research Foundation estimates water reductions of 20-50% when using mild to aggressive landscape conversion programs. The Water Conservation Act (SBX 7-7) requires the state to achieve a 20% reduction in urban per capita water use by the year 2020. Similar to energy efficiency programs, we assume an annual water efficiency savings of 1% due to water efficiency programs after 2020. The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer.
Sources	AWWA Research Foundation, "Residential End Uses of Water," 1999, http://www.waterrf.org/publicreportlibrary/rfr90781_1999_241a.pdf Water Research Foundation, "Residential End Uses of Water, Version 2 Executive Report," 2016, EPA WaterSense, "Water Efficiency in the Commercial and Institutional Sector: Considerations for a WaterSense Program," August 20, 2009, https://www3.epa.gov/watersense/docs/ci_whitepaper.pdf Pacific Institute, "Urban Water Conservation and Efficiency Potential in California," June 2014, http://pacinst.org/app/uploads/2014/06/ca-water-urban.pdf California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006 Town of Yountville water consumption by service rate for 2010.

Calculation

	2020	2030
Outdoor water consumption 2010	137,970,738 gallons	137,970,738 gallons
Percent outdoor water reduced	20%	30%
Outdoor water consumption reduction	27,594,148 gallons	41,391,222 gallons
Electricity saved	96,580 kWh	144,869 kWh
GHG emissions reduction	10.6 $MTCO_2e$	6.5 $MTCO_2e$

RAINWATER CATCHMENT

Community Action 3-3

Action	Reduce potable water use for landscape irrigation.
Reductions ($MTCO_2e$) 0.0 0.0	 2020 2030
Methodology and Assumptions	Rainwater cisterns vary in size from 50 gallon barrels to 15,000+ gallon storage tanks. This analysis assumes 50 gallon tanks for existing homes and 500 gallon tanks for new home. We assume tanks are emptied twice per year. The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer.
Sources	Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006

Calculation

	2020	2030
New housing units from 2016	18 units	42 units
Average storage tank size for new residential	500 gallons	500 gallons
Participating households in rain barrel program	50 barrels	200 barrels
Average storage for rain barrel	50 gallons	50 gallons
Total gallons rainwater stored	14,099 gallons	41,230 gallons
Avoided water-related electricity use	49 kWh	144 kWh
GHG emissions reduction	0.01 $MTCO_2e$	0.01 $MTCO_2e$

GREYWATER SYSTEMS *Community Action 3-4*	
Action	Reduce potable water use for landscape irrigation.
Reductions ($MTCO_2e$) -0.2 -0.3	 2020 2030
Methodology and Assumptions	CAPCOA Measure WSW-2 used for estimating greywater generation. Assumes 25 gallons generated per residential occupant per day from showers, bathtubs, and wash basins and 15 gallons per occupant per day from laundry machines. Greywater assumed to be used for landscape irrigation for the typical irrigation season of May through October. The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer and 1,911 kWh/MG to treat wastewater in northern California. The measure calculates avoided electricity for wastewater treatment only.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006

Calculation

	2020	2030
Greywater generation per residential occupant per day	40 gallons	40 gallons
Greywater generation per household per year available for irrigation	13,578 gallons	13,724 gallons
New housing units from 2016	18 units	42 units
Participating households in greywater program	50 households	200 households
Avoided electricity use	1,770 kWh	6,359 kWh
GHG emissions reduction	0.19 $MTCO_2e$	0.29 $MTCO_2e$

WASTEWATER TREATMENT *Government Operations Action 3-5*	
Action	Reduce greenhouse gas emissions associated with the treatment of wastewater
Reductions ($MTCO_2e$) -633.1 -686.0	 2020 2030
Methodology and Assumptions	Wastewater process emissions have been significantly reduced with the implementation of the Methane Recapture program in 2012, which re-uses digester gas to heat digester sludge, thereby preventing methane from being released into the atmosphere and displacing natural gas that was previously purchased from PG&E. Methane is now either re-used or flared off, although a small percentage (approximately 1%) escapes into the atmosphere. The Wastewater Treatment Plant utilized 902,000 cfs digester gas in 2015 (Don Moore).
Sources	Town of Yountville, "ICLEI Final Master Data Workbook for Local Government Operations Emissions Inventory," Dec. 12, 2013. Personal communication with Don Moore, Town of Yountville Utility Operations Manager, dmoore@yville.com.

Calculation

	2020	2030
Emissions from methane gas produced	589 $MTCO_2e$	642 $MTCO_2e$
Estimated fugitive methane gas after Recapture progra	0.1905 MT	0.2077 MT
Estimated fugitive methane gas after Recapture progra	4.0 $MTCO_2e$	4.4 $MTCO_2e$
GHG emissions reduction	585.2 $MTCO_2e$	638.1 $MTCO_2e$

Natural gas displaced	9,022 therms	9,022 therms
GHG emissions reduction	48.0 $MTCO_2e$	48.0 $MTCO_2e$

WATER-EFFICIENT LANDSCAPING *Government Operations Action 3-6*	
Action	Replace spray irrigation with drip irrigation systems and utilize weather-based irrigation controllers wherever feasible. Replace plants with drought-tolerant species when renovating landscaping.
Reductions ($MTCO_2e$) -1.4 -1.4	 2020 2030
Methodology and Assumptions	The Town has completed several water-efficient landscaping projects including: installation of an EPIC irrigation system to irrigate the lawn on the north side of Community Hall from below the ground, which greatly reduces the amount of irrigation water and loss of water to evaporation; and installation of efficient sprinklers, drought tolerant landscaping, mulch, and weather-based irrigation controllers. Reduction in outdoor water use is based on the following: Water-efficient landscape irrigation systems reduce outdoor water use by 6.1% (CAPCOA Measure WUW-4). The Water Research Foundation estimates water reductions of 20-50% when using mild to aggressive landscape conversion programs. Weather-based irrigation systems reduce water use by 9.4% at single family sites and 27.5% at commercial sites. Since Town properties are well-maintained, we have assumed the average, or approximately 18%, for this measure. The California Energy Commission estimates that it takes 3,500 kWh of electricity per million gallons to convey, treat and distribute water from the water source to the customer.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Pacific Institute, "Urban Water Conservation and Efficiency Potential in California," June 2014, http://pacinst.org/app/uploads/2014/06/ca-water-urban.pdf Municipal Water District of Orange County, "Final MWDOC Smart Timer Rebate Program Evaluation," November 2011, http://www.mwdoc.com/cms2/ckfinder/files/files/SmartTimerRebateEval_Final.pdf Refining Estimates of Water-Related Energy Use in California, California Energy Commission, Dec. 2006 Town water payments, FY 2009-2010 through FY 2013-2014.

Calculation

	2020	2030
Outdoor municipal water use for parks, 5 year average	5,548,200 gallons	5,548,200 gallons
Potential water use reduction	1,928,055 gallons	1,928,055 gallons
Reduction in electricity use	6,748 kWh	6,748 kWh
GHG emissions reduction	1.4 $MTCO_2e$	1.4 $MTCO_2e$

COMMUNITY WASTE *Community Action 4-1*	
Action	Reduce waste sent to the landfill by composting organic materials, increasing recycling, reusing materials, and reducing consumption.
Reductions ($MTCO_2e$) -198.9 -354.4	 2020 2030
Methodology and Assumptions	Commencing January 1, 2020, AB 1594 mandates that the use of green material as alternative daily cover (ADC) no longer constitutes diversion through recycling. UVDS states that 100% of organic ADC material will be diverted to compost and gasification by 2020. AB 1826 requires businesses that generate 8 cubic yards of organic waste or more a week to source separate food scraps and yard trimmings and arrange for recycling services of that organic waste, beginning in 2016. By 2019, the requirement covers all businesses generating 4 cubic yards a week of solid waste. On or after January 1, 2020, if CalRecycle determines that the statewide disposal of organic waste has not been reduced by 50 percent of the level of disposal in 2014, the organic recycling requirements on businesses will expand to cover businesses that generate 2 cubic yards or more of commercial solid waste per week. The Statewide goal is to have 50% of all organic commercial waste diverted from the landfill by 2020 and 95% by 2030. We assume 50% of households will divert food waste from their garbage cans, with through home composting or curbside collection by 2020 and 90% by 2030. We assume recycling rates for paper waste and residential green waste will increase so that 50% of is diverted by 2020 and 90% is diverted by 2030 over 2010 levels.
Sources	Upper Valley Waste Disposal and Napa Recycling & Waste Services, "Waste Sector Napa County Climate Action Plan 2013," September 17, 2013. Personal communication with Christy Abreu, Upper Valley Waste Disposal, Education Director, christy@uvds.com, August 1, 2016.

Calculation

	2020	2030
Waste emissions for green waste ADC less government operations	25.0 $MTCO_2e$	27.3 $MTCO_2e$
Percent diverted from landfill	100%	100%
GHG emissions reduction	25.0 $MTCO_2e$	27.3 $MTCO_2e$

Waste emissions for residential food waste	89.6 $MTCO_2e$	91.2 $MTCO_2e$
Percent diverted from landfill	50%	90%
GHG emissions reduction	44.8 $MTCO_2e$	82.1 $MTCO_2e$

Waste emissions for residential paper and green waste	135.4 $MTCO_2e$	138.0 $MTCO_2e$
Percent diverted from landfill	50%	90%
GHG emissions reduction	67.7 $MTCO_2e$	124.2 $MTCO_2e$

Waste emissions for commercial food and green waste, less government operations	58.6 $MTCO_2e$	60.5 $MTCO_2e$
Percent diverted from landfill	50%	95%
GHG emissions reduction	29.3 $MTCO_2e$	57.5 $MTCO_2e$

Waste emissions for commercial paper waste, less government operations	64.3 $MTCO_2e$	66.6 $MTCO_2e$
Percent diverted from landfill	50%	95%
GHG emissions reduction	32.1 $MTCO_2e$	63.3 $MTCO_2e$

MUNICIPAL WASTE *Government Operations Action 4-2*	
Action	Reduce waste sent to the landfill by composting organic materials, increasing recycling, reusing materials, and reducing consumption.
Reductions ($MTCO_2e$) -32.7 -34.9	 2020 2030
Methodology and Assumptions	We assume 100% of green and food waste and sludge will be diverted to compost or gasification by Upper Waste Disposal by 2020. This will require the Town to ensure separation of all materials at the source. We assume the Town can increase its recycling rate to 50% of paper and wood waste by 2020 and 95% by 2030, over 2010 levels.
Sources	

Calculation

	2020	2030
Food, green waste and sludge emissions	30.2 $MTCO_2e$	30.2 $MTCO_2e$
Percent diverted from landfill	100%	100%
GHG emissions reduction	30.2 $MTCO_2e$	30.2 $MTCO_2e$

Paper and wood waste emissions	5.0 $MTCO_2e$	5.0 $MTCO_2e$
Percent diverted from landfill	50%	95%
GHG emissions reduction	2.5 $MTCO_2e$	4.8 $MTCO_2e$

TREE PLANTING ON PRIVATE LAND *Community Action 5-1*	
Action	Increase Yountville's tree cover.
Reductions ($MTCO_2e$) -0.7 -1.4	 2020 2030
Methodology and Assumptions	The Town has a tree replacement policy for trees on private property. Whenever a tree is removed that requires a tree removal permit, the property owner must plant a replacement tree at the owner's expense. If a replacement tree is not feasible, then the owner may pay an in-lieu fee, and the Town will then plant a tree somewhere in the Town (usually at a park or open space). This measure quantifies GHG savings from planting additional, non-replacement trees. Sequestration: CAPCOA Measure V-1. Assumed default annual sequestration rate of .0354 MTCO2 accumulation per tree per year and an active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2020	2030
Annual sequestration rate per tree	0.0354 $MTCO_2$	0.0354 $MTCO_2$
Number of tree planted each year	2 trees	2 trees
Number of years	10 years	20 years
Number of trees planted over period in active growing stage in inventory year	20 trees	40 trees
GHG emissions reduction from sequestration	0.7 $MTCO_2e$	1.4 $MTCO_2e$

TREE PLANTING ON PUBLIC LAND *Government Operations Action 5-2*	
Action	Increase the number of trees on Town land.
Reductions ($MTCO_2e$) -0.4 -0.7	 2020 2030
Methodology and Assumptions	The Town has a goal to be a "Tree City USA" community each year, which requires a minimum of one new (non-replacement) tree per year. The Town intends to develop an urban forest management plan in FY 16-17 which may have higher targets. We have assumed minimum targets for this measure. Sequestration: CAPCOA Measure V-1. Assumed default annual sequestration rate of .0354 MTCO2 accumulation per tree per year and an active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010.

Calculation

	2020	2030
Annual sequestration rate per tree	0.0354 $MTCO_2$	0.0354 $MTCO_2$
Number of trees planted each year	1	1
Number of years	10	20
Number of trees planted over period in active growing stage in inventory year	10	20
GHG emissions reduction from sequestration	0.4 $MTCO_2e$	0.7 $MTCO_2e$

RENEWABLE PORTFOLIO STANDARD *State Action*	
Program Description	The Renewable Portfolio Standard (RPS) requires electricity providers to increase the portion of energy that comes from renewable sources to 33% by 2020 and 50% by 2030.
Reductions (MTCO2e) -2,137.6 -2,151.2	 2020 2030
Methodology and Assumptions	This State Action assumes both electricity providers will meet the Renewable Portfolio standard requirements. Additional GHG reductions related to MCE 's more aggressive GHG reduction policies are quantified separately as a local action. The CPUC calculator only provides projected emission factors for 2020. Therefore, the same projected emission factor was used for 2030.
Sources	GHG Calculator, version 3c_Oct2010. https://ethree.com/public_projects/cpuc2.php PG&E, "Greenhouse Gas Emission Factors: Guidance for PG&E Customers," November 2015, https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf

Calculation

	2020	2030
Electricity use, BAU	18,830,879 kWh	19,358,773 kWh
Electricity saved through other State actions	2,785,790 kWh	3,211,306 kWh
Net electricity use	16,045,089 kWh	16,147,467 kWh
Electricity emissions, BAU	3,266 $MTCO_2e$	3,287 $MTCO_2e$
Electricity emissions w/RPS	2,138 $MTCO_2e$	2,151 $MTCO_2e$
GHG emission reductions	1,128 $MTCO_2e$	1,135 $MTCO_2e$

TITLE 24 *State Action*	
Reductions (MTCO2e) -216.3 -411.8	2020: Implement Title 24 and subsequent building standards updates that ultimately achieve zero net energy use for new residential and non-residential construction. 2030: Implement Title 24 and subsequent building standards updates that ultimately achieve zero net energy use for new residential and non-residential construction.
Methodology and Assumptions	The California Energy Commission's 2007 Integrated Policy Report established the goal that new building standards achieve "net zero energy" levels by 2020 for residences single family and low-rise multifamily 3 stories or less) and by 2030 for commercial buildings. The California Public Utility Commission's (CPUC) California Long Term Energy Efficiency Strategic Plan, dated July 2008, endorses the Energy Commission's zero net energy goals for all newly constructed homes by 2020 and for all newly constructed commercial buildings by 2030.
Sources	California Energy Commission, "Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings," prepared by Architectural Energy Corporation, November 7, 2007. California Energy Commission, http://www.energy.ca.gov/title24/2013standards/background.html California Energy Commission, http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2012-5-31-Item-05-Adoption_Hearing_Presentation.pdf California Energy Commission, http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf

	2008 Reductions from 2005 Standards (assumed for development 2011-2013)		2013 Reductions from 2008 Standards (assumed for development 2014-2016)	2016 Reductions from 2013 Standards (assumed for development after 2017)	Projected -- Reductions from 2010 Baseline	
					2020	2030
Reductions from Title 24 Upgrades	Electricity Savings	Natural Gas Savings	Energy Savings	Energy Savings	Energy Savings	Energy Savings
Single-family New Construction	22.70%	10.00%	25.00%	28.00%	100%	100%
High Rise Multi-family New Construction (more than 3 stories	19.70%	7.00%	14.00%			100%
Non-residential New Construction	4.90%	9.40%	30.00%	5.00%		100%

Projected Residential Development with Title 24 Energy Reductions

	2011-2013	2014-2016	2017-2020	2021-2030	TOTAL through 2020	GHG Reductions through 2020	TOTAL through 2030	GHG Reductions through 2030
New Residential (units)	30	10	18	24	58		82	
Electricity Use BAU	182,900	60,967	110,942	147,923	354,810		502,733	
Electricity Use Savings	41,518	25,621	64,633	147,923	131,773	18	279,696	37
Natural Gas Use BAU	13,928	4,643	8,448	11,264	27,019		38,283	
Natural Gas Use Savings	1,393	1,509	4,342	11,264	7,244	39	18,508	98

Projected Non-Residential Development with Title 24 Energy Reductions

	2011-2013	2014-2016	2017-2020	2021-2030	TOTAL through 2020	GHG Reductions through 2020	TOTAL through 2030	GHG Reductions through 2030
Electricity Use BAU	473,620	473,620	473,620	405,960	1,420,860		1,826,821	
Electricity Use Savings	23,207	158,331	174,096	277,592	355,634	47	633,227	84
Natural Gas Use BAU	24,773	24,773	24,773	21,234	74,320		95,554	
Natural Gas Use Savings	2,329	9,062	9,848	14,837	21,238	113	36,076	192

LIGHTING EFFICIENCY AND TOXIC REDUCTION ACT *State Action*	
Program Description	AB 1109, the Lighting Efficiency and Toxic Reduction Act, tasks the California Energy Commission (CEC) with reducing lighting energy usage in indoor residences by no less than 50% from 2007 levels by 2018, as well as requires a 25% reduction in indoor and outdoor commercial buildings by the same date. To achieve these efficiency levels, the CEC applies its existing appliance efficiency standards to include lighting products, as well as requires minimum lumen/watt standards for different categories of lighting products. The bill also expands existing incentives for energy efficient lighting.
Reductions (MTCO2e) -234.9 -234.9	 2020 2030
Methodology and Assumptions	State action applies to buildings constructed before 2010. 5.2% of nonresidential electricity is used for outdoor lighting (California Energy Commission 2006) 28.9% of nonresidential electricity is used for indoor lighting (California Energy Commission 2006) Residences use 1,342 kWh for indoor lighting on average (U.S. Department of Energy 2012)
Sources	Itron, Inc., "California Commercial End-Use Survey," California Energy Commission, March 2006, Publication Number: CEC-400-2006-005, p. 186. Accessed March 26, 2015. <http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2010-lmc-final-jan-2012.pdf> Navigant Consulting, Inc., "2010 U.S. Lighting Market Characterization," U.S. Department of Energy, January 2012, p. 42. Accessed March 26, 2015. <http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/2010-lmc-final-jan-2012.pdf>

Calculation

	2020	2030
Residential electricity indoor lighting use, 2010	1,680,184 kWh	1,680,184 kWh
Commercial electricity use, 2010	10,825,603 kWh	10,825,603 kWh
Commercial indoor and outdoor lighting use, 201	3,691,531 kWh	3,691,531 kWh
Reduction in residential electricity use	840,092 kWh	840,092 kWh
Reduction in commercial electricity use	922,883 kWh	922,883 kWh
GHG emission reductions	234.9 $MTCO_2e$	234.9 $MTCO_2e$

RESIDENTIAL SOLAR WATER HEATERS *State Action*	
Program Description	The Residential Solar Water Heater Program (AB 1470) creates a $25 million per year, 10-year incentive program to encourage the installation of solar water heating systems that offset natural gas and electricity use in homes and businesses throughout the State. The goal is to install 200,000 solar water heaters by 2017.
Reductions (MTCO2e) -10.6 -10.6	 2020 2030
Methodology and Assumptions	Natural gas solar water heaters reduce natural gas use by 130 therms (U.S. Department of Energy 2010) Electric solar water heaters reduce electricity use by 2,429 kWh (U.S. Department of Energy 2010) An average of 0.013 water heaters per home will be replaced as a result of the strategy in 2020 (California Air Resources Board 2008) 85% of California homes use natural gas for water heating, 4% use propane/LPG, and 11% use electricity (U.S. Energy Information Administration 2009)
Sources	U.S. Department of Energy, "ENERGY STAR Water Heater Market Profile," September 2010, p. 15. Accessed March 27, 2015. <https://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/water_heaters/Water_Heater_Market_Profile_2010.pdf> U.S. Energy Information Administration, 2009 Residential Energy Consumption Survey, Table HC8.11, "Water Heating in U.S. Homes in West Region, Division, and States, 2009." Accessed March 26, 2015. <http://www.eia.gov/consumption/residential/data/2009/#undefined>

Calculation

	2020	2030
Number of housing units, 2010	1,252	1,252
Number of solar water heaters installed	16	16
Percent electric water heaters	11%	0
Percent natural gas water heaters	89%	1
Reduction in electricity use	4,349 kWh	4,349 kWh
Reduction in natural gas use	1,883 therms	1,883 therms
GHG emission reductions	10.6 MTCO2e	10.6 MTCO2e

CALIFORNIA SOLAR INITIATIVE *State Action*	
Program Description	The California Solar Initiative (CSI) was a solar rebate program for California consumers that are customers of the investor-owned utilities, including PG&E.
Reductions ($MTCO_2e$) -91.8 -91.8	 2020 2030
Methodology and Assumptions	This measure includes solar PV systems that were installed from 2010 through the end of the CSI program in 2013. 6 residential systems were installed between 2010 and 2013 with a total of 35.5 kW. 2 commercial systems were installed with a total of 298.5 kW.
Sources	California Solar Initiative, http://www.californiasolarstatistics.ca.gov/. Electricity production estimates from Jonathan Whelan, Senior Project Manager, Optony, Inc.

Calculation

Residential Renewable Energy

Number of residential systems installed between 2010 and 2013	6
Annual electricity savings	47,914 kWh
Electricity emissions reductions	9.8 $MTCO_2e$

Commercial Renewable Energy

Number of commercial systems installed between 2010 and 2013	2
Annual electricity savings	403,036 kWh
Electricity emissions reductions	82.0 MTCO2e

LIGHT AND HEAVY DUTY FLEET REGULATIONS

State Action

Reductions ($MTCO_2e$)	
-234.3	2020
-637.4	2030
Methodology and Assumptions	Current federal and State regulations and standards will reduce transportation emissions from the light and heavy duty fleet. These include: 1. Pavley Standards which increase fuel economy standards for light-duty vehicles for 2009-2016 model years. 2. Advanced Clean Cars Program which will reduce greenhouse gas and smog emissions for light-duty vehicles sold between 2017 and 2025. New automobiles will emit 34 percent fewer GHG emissions and 75 percent fewer smog-forming emissions. 3. ARB Tractor -Trailer Greenhouse Gas Regulations which accelerate the use of low rolling resistance tires and aerodynamic fairing to reduce GHG emissions in the heavy-duty truck fleet. 4. Heavy Duty GHG Emissions Standards (Phase One) which establish GHG and fuel efficiency standards for medium duty and heavy duty engines and vehicles for 2014-2018 model years. Transportation emissions estimated using EMFAC 2014.
Sources	California Air Resources Board, EMFAC 2014 Web Database, http://www.arb.ca.gov/emfac/2014/ California Air Resources Board, EMFAC 2014 Volume III - Technical Documentation, v1.0.7, May 12, 2015

Calculation

	2020	2030
VMT BAU	4,095,592 VMT	3,986,156 VMT
Emissions, BAU	1,982 $MTCO_2e$	1,929 $MTCO_2e$
Emissions with regulations	1,731 $MTCO_2e$	1,245 $MTCO_2e$
Reduction in emissions	251 $MTCO_2e$	684 $MTCO_2e$
Less reductions from other actions	234 $MTCO_2e$	637 $MTCO_2e$

RENEWABLE PORTFOLIO STANDARD FOR CONTRACTED SERVICES

State Action

Program Description	The Renewable Portfolio Standard (RPS) requires electricity providers to increase the portion of energy that comes from renewable sources to 33% by 2020 and 50% by 2030.
Reductions (MTCO2e) -5.6 -5.6	 2020 2030
Methodology and Assumptions	This State Action assumes both electricity providers will meet the Renewable Portfolio standard requirements. We have assumed the Town's contracted services, which represent the Napa County Fire Department and Napa County Sheriff Department, will use PG&E electricity. The CPUC calculator only provides projected emission factors for 2020. Therefore, the same projected emission factor was used for 2030.
Sources	GHG Calculator, version 3c_Oct2010. https://ethree.com/public_projects/cpuc2.php PG&E, "Greenhouse Gas Emission Factors: Guidance for PG&E Customers," November 2015, https://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf

Calculation

	2020	2030
Electricity use for contracted services	80,110 kWh	80,110 kWh
Electricity emissions, BAU	16 $MTCO_2e$	16 $MTCO_2e$
Electricity emissions w/RPS	11 $MTCO_2e$	11 $MTCO_2e$
GHG emission reductions	6 $MTCO_2e$	6 $MTCO_2e$

LIGHT AND HEAVY DUTY FLEET REGULATIONS FOR GOVERNMENT OPERATIONS

State Action

Reductions ($MTCO_2e$)	
-13.2	2020
-37.0	2030
Methodology and Assumptions	Current federal and State regulations and standards will reduce transportation emissions from the light and heavy duty fleet. These include: 1. Pavley Standards which increase fuel economy standards for light-duty vehicles for 2009-2016 model years. 2. Advanced Clean Cars Program which will reduce greenhouse gas and smog emissions for light-duty vehicles sold between 2017 and 2025. New automobiles will emit 34 percent fewer GHG emissions and 75 percent fewer smog-forming emissions. 3. ARB Tractor -Trailer Greenhouse Gas Regulations which accelerate the use of low rolling resistance tires and aerodynamic fairing to reduce GHG emissions in the heavy-duty truck fleet. 4. Heavy Duty GHG Emissions Standards (Phase One) which establish GHG and fuel efficiency standards for medium duty and heavy duty engines and vehicles for 2014-2018 model years. Transportation emissions estimated using EMFAC 2014. Reductions applied to Town of Yountville employee commute and contracted services (Napa County Fire Department, Napa County Sheriff Department and Yountville Trolley).
Sources	California Air Resources Board, EMFAC 2014 Web Database, http://www.arb.ca.gov/emfac/2014/ California Air Resources Board, EMFAC 2014 Volume III - Technical Documentation, v1.0.7, May 12, 2015

Calculation

	2020	2030
Emissions, BAU	104 $MTCO_2e$	104 $MTCO_2e$
Emissions with regulations	91 $MTCO_2e$	67 $MTCO_2e$
Reduction in emissions	13 $MTCO_2e$	37 $MTCO_2e$