

draft

napa countywide community climate action plan

DRAFT

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Our Community, Our Future: A Call to Action

Climate change is a major challenge for the 21st century. Scientific evidence increasingly shows that climate protection targets considered bold even a few years ago may now be inadequate: climate change is happening faster and on a broader scale than the world's scientists predicted just two years ago. Millions of people may experience the impacts of climate change through threats to public health, national and local economies, sea level rise and dwindling supplies of food, water and energy.

No action—business as usual—is not an option under current State law. Action is required at all levels of government to be in compliance with State law.

This Community Climate Action Plan presents a package of actions that, when implemented countywide, *will* help meet climate protection targets. Transforming our energy infrastructure from fossil fuels to renewables, using less energy overall, and generating less waste and fewer emissions will require a unity of purpose, innovation and commitment.

This Plan is based on a sound analytic process, uses internationally accepted greenhouse gas emissions (GHG) modeling, incorporates input from every city/town and the County and is geared for swift implementation. Every action included met four criteria:

1. It is under local control
2. It will result in significant GHG emission reductions
3. It is cost-effective
4. It is politically feasible

Actions proposed in the Plan will pay for themselves in energy cost and other savings and will result in an economy powered by local, reliable energy; a healthier environment; healthier people; and a preserved natural environment. It's a fiscally sound endeavor: managing government in an environmentally friendly, sustainable manner protects not only the environment but taxpayers as well.

This Plan has been developed to assist stakeholders in moving from planning to action, which will require the combined effort of residents, businesses, local government staff and elected officials in Napa County. These efforts will work along with vigorous actions, based on new and aggressive state legislation, being planned and underway statewide and in the Bay Area region. Communities across California are now assessing the impact of local emissions and creating similar action plans to address this urgent issue. The Napa County Community Climate Action Plan recognizes our connection to the larger community and our responsibility to our constituents.

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Executive Summary

Napa County's commitment to the future is the impetus for this Community Climate Action Plan. The Plan identifies 56 actions for the cities and County of Napa that have the greatest potential to reduce greenhouse gas (GHG) emissions—high-impact, high-leverage actions. High-impact actions are those proven to reduce emissions in the shortest time period. High-leverage actions are those that Napa County is best positioned to accomplish.

Actions fall into six major goals:

5. **Expand Transportation and Mobility Options:** Shift transportation from fossil fueled single occupancy vehicles (cars and light trucks) to transit, walking, bicycling; increase use of renewably powered vehicles; encourage “smart growth” land use policies that reduce the need to travel; and invest in Napa County jobs to reduce commuting.
→2020 Target: 33% of the total emissions reduction required. Includes 18% reduction due to new California Clean Car Law.
6. **Improve Buildings and Energy Efficiencies:** Invest in widespread energy and water efficiency to reduce energy demand and emissions (primarily in existing buildings); reduce the carbon intensity of the energy that is used by investing in Napa County renewable energy sources.
→2020 Target: 67% of the total emissions reduction required. This includes a 24% reduction resulting from efficiency improvements and 43% reduction from development of a low carbon electricity and natural gas portfolio consisting of renewable energy sources.
7. **Reduce Consumption and Solid Waste:** Develop policies and programs to significantly reduce the amount of waste sent to landfills—by diverting organics to composting (which can be sold) and increasing recycling—because landfills produce methane, a very potent GHG; install gas-to-energy plants at landfills to convert gases to GHG-free electricity¹.
8. **Conserve Agriculture, Natural Resources, and Urban Forests:** Agriculture and forests can both generate energy through waste products (e.g. biogas from anaerobic digestion, biodiesel from waste biomass) and sequester or hold carbon in soil, on farms, vineyards, and in forests. Further research and analysis is required to develop specific reduction targets.
9. **Increase Community Engagement:** Market programs and conduct community outreach to increase participation in GHG reduction efforts; partner with business and non-profit organizations to increase outreach and education. Increasing community engagement magnifies the success of the other actions.
10. **Improve Local Government Operations:** As a minor contributor to total emissions (roughly 1.5% of total countywide emissions), actions to reduce municipal energy use will have a limited impact on Napa County's overall emission levels. However, municipal actions can help reduce local government's operating costs and have an important symbolic value demonstrating government leadership that extends beyond the amount of emissions actually reduced.

¹ Significant solid waste reductions are identified. However, these reductions do not count toward the target reduction since they are outside the scope of what's counted in the accepted statewide methodology used to track solid waste emissions.

Climate Protection Imperative

The principle that underlies GHG emission reduction targets and climate protection is meeting the scientific imperative, the goal dictated by current scientific evidence to ensure that human societies remain in balance with the abilities of natural systems to sustain them. The concentration of carbon dioxide in the atmosphere is the single best indicator of the climate crisis. The concentration is now 390 parts per million and must return to 350, according to leading scientists. The only way to do that is to reduce GHG emissions.

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In 2005 by Executive Order, Governor Schwarzenegger established GHG emission reduction targets for the state:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

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In 2006, the Governor signed into law AB 32, the Global Warming Actions Act, which established these targets as state law. With the passage of AB 32, California communities can now leap over the process of setting local targets by adopting the State's target as their own. Doing so has the benefit of harmonizing local goals with State goals. Additionally, communities can advance more quickly to climate protection planning and implementation.

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Need for Action

Leading scientists and members of the Intergovernmental Panel on Climate Change, the world's foremost scientific climate change authority, report that carbon emissions and resultant greenhouse gases from human activities may be rapidly destabilizing Earth's climate.

- **Sea Level Rise:** Because of its proximity to the Napa River, the southern part of Napa County will be affected by projected sea-level rise. A predicted 16-inch rise by mid-century would result in significant portions of Napa County being subject to increased flooding.
- **Agriculture:** A changing climate could affect or alter agricultural activities by changing the growing season, temperatures and humidity.
- **Water Supply:** With declining rainfall, Napa may not be able to rely on past water sources for residences, industry and agriculture.
- **Flooding:** Less frequent but more intense storms can cause flooding and mudslides.
- **Public Health:** Warming temperatures can encourage mosquito breeding and the illnesses they bring, and more extreme temperatures can affect the health of vulnerable populations such as seniors and infants.
- **Native Plants and Habitat:** Native plants and will change or become extinct, leading to loss of habitat; for instance, loss of habitat for fish that are of both economic and recreational interest to residents.

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2020 Objectives and Actions

As noted previously, the State of California has stated that California will reduce total greenhouse gas (GHG) emissions to 1990 levels by 2020. How that will translate into specific regional and local targets will be determined in the next few years.

GHG emissions inventories for Napa cities and the County were completed using 2005 as the baseline year and, in accord with the California Air Resources Board formula, used a proxy measure for 1990 levels—15% below 2005. The amount of GHG emissions that each city must reduce to meet the 2020 target varies. Regional actions now being planned will also affect local jurisdictions, recognizing that GHG emissions (particularly from transportation) are not a purely local phenomenon but need to be addressed in a regional context.

GHG Emissions: 30% Countywide Reduction by 2020

	1990 Level (metric tons of CO ₂ e)	2020 “Do Nothing” Forecast	Reduction Needed	% Reduction Needed
American Canyon	77,732	152,393	74,662	49%
Calistoga	24,163	31,480	7,317	23%
City of Napa	386,803	544,572	157,769	29%
St. Helena	39,144	49,541	10,397	21%
Yountville	24,059	31,924	7,865	25%
Unincorporated Area	468,338	656,989	188,651	29%
Total	1,020,239	1,466,900	446,661	30%

To achieve the 2020 target, Napa County must pursue reduction measures in four main sectors: transportation, buildings/energy, solid waste disposal and agriculture.

Some sectors may need to be over-emphasized early on to make up for lack of quick progress in other sectors. For example, the transportation sector produces the greatest amount of Napa County’s GHG emissions, approximately 53%. So emission reduction strategies should yield the greatest results in this area. However, reductions in the transportation sector are very long-term, requiring land use and infrastructure and technology changes that cannot be accomplished very quickly. Thus short-term opportunities in the electricity and natural gas sector must be aggressively pursued to compensate for the transportation sector’s shortfall (despite the fact that only about 36 percent of GHG emissions in Napa County come from electricity/natural gas).

In fact, analysis shows that switching to renewable energy sources for buildings is the only way to achieve the overall countywide emissions reduction target (see sidebar). In the long term, emission reductions from all sectors will have to approach 80% to meet the scientific imperative goal of emissions that are 80% below 1990 levels by 2050. That means every action in this Plan needs to be undertaken.

Plan Reductions	GHG Emission Reductions	% of Total Reduction Target
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Building Efficiency Improvements	109,274	24%
Switch to Renewable Energy Sources	191,931	43%
Transportation & Land Use	145,457	33%
Plan Reductions	446,661	100%

<graphic: include target emission reduction fever chart from above table>

The chart above compares GHG emissions from 1990 to 2005 and forecasts changes out to 2020:

- The “business as usual” (BAU) or “do nothing” scenario reflects no actions taken.
- The “target reduction” line shows the overall countywide reduction target.
- “Building Efficiency Improvements” reductions result from investment in widespread energy and water efficiency measures that reduce demand for electricity and natural gas.
- “Transportation and Land Use” reductions result from land use changes, infrastructure improvements and new technology that reduces demand for fossil fuel use vehicles.
- “Switch to Renewable Energy Sources” reductions come from rapid development and adoption of renewable energy sources.

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Energy-Efficient Buildings are Key

Improving energy efficiency is the most cost-effective approach for reducing GHG emissions. Reducing energy demand is the equivalent of replacing emitting energy sources with non-emitting sources. Thus, an efficiency retrofit of existing buildings that lowers energy consumption is equivalent to building virtual windmills.

In addition to improving building efficiency, analysis shows that switching to renewable energy sources for buildings is the only way to achieve the 2020 countywide emissions reduction target because emissions in the transportation sector, which accounts for 55% of the total, require more long-term and costly actions including extensive transportation infrastructure modifications and technology advancement. In 2020, therefore, all buildings must consume roughly 50% less energy than in 2005 to meet Napa’s countywide target objective.

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Climate Protection Co-Benefits

More than just reducing carbon emissions, climate protection will yield other important benefits for Napa County Residents.

- **Support the Local Economy:** Hundreds of jobs may be created through the emerging renewable energy industry, retrofitting buildings, and new neighborhood serving businesses as part of transit-oriented development.
- **Save Money.** Most recommended actions, such as retrofitting and renewable energy alternatives, will actually pay for themselves in a short time, saving money year after year.
- **Support a Healthy Living Environment.** Developing urban centers that are walkable and bikeable encourages outdoor exercise and greater connection to community.
- **Clean Up the Air.** Reducing emissions results in healthier air for everyone.
- **Napa as a Model.** Napa County can expand its international reputation by becoming a model of a collaborative, regional approach that gets results.

Plan Development Process

In February 2009, the Napa County Transportation and Planning Agency (NCTPA), which includes staff and elected officials from all local jurisdictions, completed an initial countywide assessment of GHG emissions. This inventory was further refined in August 2009 and serves as the baseline for forecasting future emissions, as well as helping inform the actions identified in this Climate Action Plan.

City and County staff from all Napa County jurisdictions participated in a series of work sessions to develop a list of countywide actions to reduce GHG emissions with specific local actions identified whenever possible. This countywide list and other potential actions were subsequently evaluated using GHG reduction modeling software and expert analysis and studies. The result of this technical analysis is an estimate of expected GHG reductions and their associated costs.

The development of this Plan follows the “Five-Step Milestone Process” developed by ICLEI—Local Governments for Sustainability. This step-by-step process provides communities with a way to address a global problem at the local level—by adopting practices and policies to reduce GHG emissions, improve air quality, and enhance community livability and economic vitality.

- **Step 1—Baseline emissions inventory and forecast:** Current and forecast GHG emissions (if nothing is done) for transportation, electricity and natural gas, solid waste and agriculture in the County and cities of Napa.
- **Step 2—Emissions and reduction targets:** The specific reductions needed in each sector and jurisdiction to reach the 2020 goal.
- **Step 3—Local action plans:** The specific actions to be pursued in the local jurisdictions to reduce emissions (presented in this Climate Action Plan).
- **Step 4—Implement policies and measures:** Cities and the County implement the Plan, while partners such as other local agencies, businesses, schools, non-profit organizations and individuals also embark on programs to reduce GHG emissions (major efforts are already underway).
- **Step 5—Monitor and verify results:** Ongoing monitoring will allow the Plan to evolve and be built on as new climate-related technology, policies, best practices and resources become available.

Each action in the Plan had to meet four criteria before being included: it must be under local control so that it can be implemented by local governments or businesses; it must lead to a significant reduction in GHG emissions (using the Napa County Carbon Model—see Appendix); it must be cost-effective over its life cycle in that it will pay for itself in energy cost savings; and it must be politically feasible.

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Based on this Plan, local governments and agencies will aim to:

- Develop forward-looking policies;
- Make progressive land use decisions;
- Encourage walking and biking;
- Encourage renewable energy development and use;
- Effectively use codes and ordinances;
- Sustainably manage landfills and waste treatment plants;
- Conserve agriculture and open space;
- Operate more integrated efficient public transportation networks; and
- Implement eco-friendly, sustainable practices.

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Introduction and Background

Modern human activity, most notably the burning of fossil fuels for transportation and electricity generation, introduces large additional amounts of carbon dioxide and other greenhouse gases into the atmosphere. Reductions in the planet's forested regions, which absorb greenhouse gases, are also a major contributor to the increasing greenhouse effect. In the absence of the greenhouse effect and an atmosphere, the [Earth's](#) average surface temperature of 14 °C (57 °F) could be as low as -18 °C (-0.4 °F), the [black body](#) temperature of the Earth. [Global warming](#), a recent warming of the Earth's surface and lower atmosphere, is believed to be the result of an "enhanced greenhouse effect" mostly (more than 50%) due to human-produced increases in atmospheric [greenhouse gases](#). Collectively, the burning of fossil fuel and deforestation intensify the natural greenhouse effect, causing global average surface temperature to rise, which in turn affects global climate patterns.

The 2005 regional population projections estimate Napa County's population at 133,574. The energy consumed and the waste produced within the county's boundaries result in thousands of tons of heat-trapping greenhouse gas emissions. But, as is evidenced by the widespread and active involvement of staff from all jurisdictions in Napa County in the development of a Climate Protection Action Plan, local governments are firmly committed to building on existing efforts to reduce the emissions that cause global warming.

Because we can only manage what we measure, the first step in managing greenhouse gas emissions, therefore, is to establish an inventory of those emissions. For a regional context, below is a chart of Bay Area County greenhouse gas emissions in tons of carbon dioxide equivalent (tons CO₂e). California—considered as if were a country of its own—is the 16th largest GHG emitter in the world, second only to Texas in the US. However, per capita emissions in California are among the lowest in the US, and emissions in Napa County are less than the California average.

Per Capita GHG Emissions for Bay Area Counties²

County	Electricity	Natural Gas	Transportation	Total	Population	Per Capita
Alameda	4,086,682	2,786,826	8,547,708	15,421,215	1,509,981	10.2
Contra Costa	3,152,822	5,269,882	4,798,656	13,221,360	1,030,732	12.8
Marin	529,626	494,814	1,573,426	2,597,867	253,818	10.2
Napa	360,518	237,423	659,023	1,256,964	134,326	9.4
San Francisco	2,046,454	1,563,443	1,964,007	5,573,904	800,099	7.0
San Mateo	1,776,987	1,381,760	4,050,152	7,208,899	726,336	9.9
Santa Clara	5,871,420	2,903,755	9,441,863	18,217,038	1,780,449	10.2
Solano	1,108,005	2,861,777	2,723,614	6,693,397	421,542	15.9
Sonoma	1,080,805	783,478	2,499,586	4,363,869	478,222	9.1
Totals	20,013,319	18,283,158	36,258,035	74,554,512	7,135,505	10.5

² Climate Protection in the San Francisco Bay Area, September 2007, prepared by the Climate Protection Campaign.

Climate Protection Imperative and GHG Reduction Target

The principle underlying GHG emission reduction targets—and climate protection in general—is meeting the scientific imperative, the goal dictated by current scientific evidence to ensure that human societies remain in balance with the abilities of natural systems to sustain them. The amount of carbon dioxide in the atmosphere is the best single indicator of the climate crisis—the higher the concentration of carbon dioxide, the more dire the climate crisis. The concentration is now 390 parts per million and must return to 350, according to leading scientists.

Prior to 2005, California communities had a harder task setting GHG emission reduction targets than they do now. In 2005 Governor Schwarzenegger established GHG emission reduction targets for the state. In 2006 the Governor reinforced the 1990 level by 2020 target by signing into law AB 32, the Global Warming Actions Act.

An example of the extent to which communities can go to set targets is Sonoma County, where the target-setting process for all nine cities and the County took about a year. As part of the process, representatives from government, business, youth and the community at large assembled for an all-day workshop to consider a target for Sonoma County. Their recommended target—25% below 1990 levels by 2015—was the boldest community target in the nation and was subsequently established by each Sonoma city and the County. The advantage of this approach was developing commitment and alignment among leadership of the various sectors of Sonoma County. The disadvantage was the large investment of time, attention, and funds.

With the passage of AB 32, California communities can now leap over the process of setting local targets by adopting the State's target as their own. Doing so has the benefit of synchronizing local goals with State goals. Additionally, communities can advance more quickly to climate protection planning and implementation.

Many communities have difficulty determining their 1990 baseline because data from 1990 is difficult to access. Recognizing this, the Air Resources Board, the California body charged with implementing AB 32, has stated that “reducing greenhouse gas emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from today's levels.”³

GHG emissions inventories for Napa cities and the County, completed in March 2009 in cooperation with ICLEI staff, used 2005 as the baseline year. Also shown are 2020 emissions projections if we do nothing and simply continue business as usual. The next column in the table shows the amount of emissions Napa cities and the County need to reduce from projected “do nothing” levels to meet a 2020 GHG emissions target that matches the target established by the State. The last column gives the percentage reduction required to meet AB 32 goals: a 30% countywide reduction.

³ Climate Change Proposed Scoping Plan: A Framework for Change,” California Air Resources Board, October 2008.

GHG Emissions: 30% Reduction Countywide

	2005 Baseline	1990 Level (metric tons)	2020 “Do Nothing” forecast	Reduction Needed (tons)	% Reduction Needed
A. Canyon	91,449	77,732	152,393	74,662	49%
Calistoga	28,427	24,163	31,480	7,317	23%
City of Napa	455,062	386,803	544,572	157,769	29%
St. Helena	46,052	39,144	49,541	10,397	21%
Yountville	28,305	24,059	31,924	7,865	25%
Unincorporated	550,986	468,338	656,989	188,651	29%
Total	1,200,281	1,020,239	1,466,900	446,661	30%

Local Climate Change Impact

While climate change is a global problem influenced by an array of interrelated factors, climate change is also a local problem with serious impacts foreseen for the cities and County of Napa.

Sea Level Rise

According to the San Francisco Bay Conservation and Development Commission (BCDC), the sea level in the Bay Area is expected to rise up to 55 inches during the next hundred years. The Pew Center on Climate Change has reported that such a rise would result in the erosion of beaches, bay shores and river deltas, marshes and wetlands and increased salinity of estuaries, marshes, rivers and aquifers.⁴ This increased salinity has the potential to damage or destroy crops in low-lying farmlands. Infrastructure at or near sea level, such as harbors, bridges, and roads, would also be impacted by a rising sea level.

BCDC has modeled the impact of sea level rise for two different scenarios (16 inches at mid-century and 55 inches at the end of the century). These models illustrate that portions of Napa County, particularly along the Napa River, would be under water with just 16 inches of sea level rise. In addition, such a rise in sea level would be associated with significantly increased winter flooding.

Agriculture

Climate change is projected to have significant impacts on conditions affecting agriculture, including temperature, carbon dioxide, glacial run-off, precipitation and the interaction of these elements. Changing these elements could impact the growing season and current wine growing regions in Napa County. A key change in climate that will affect wine production is an increase in temperature. This is primarily because the temperature of land heats up much faster than the sea. Higher temperatures also mean more humidity and likelihood of heavier rainfalls. The total level of rain may not change, but rain will occur less frequently and in large bursts, resulting in less absorption and a decrease in water availability in vineyards.

⁴ Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and its Shoreline. BCDC. April 2009.

Climate change could change the style and variety of grapes cultivated in Napa. These issues are subjects of intensive study and research by the Napa Valley vintner community.

Native Plants and Wildlife

Napa County is home to a particularly diverse population of plants. Napa County has one of the highest biodiversity levels in the nation and contains 1,102 native plant taxa, or 32% of the state's native flora. The County's plants and vegetation support many wildlife species including many rare, threatened, and endangered species including the endangered California Clapper Rail, among many others.

Native plants and animals are also at risk as temperatures rise. Scientists are reporting more species moving to higher elevations or more northerly latitudes in response. Increased temperatures also provide a foothold for invasive species of weeds, insects and other threats to native species. The increased flow and salinity of water resources could also seriously affect food and mating conditions for fish that are of both of economic and recreational interest to residents. In addition, the natural cycle of plant flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture could be affected, with perennial crops such as grapes taking years to recover.

In Napa County, climate change may result in decreased genetic diversity, a reduction in seed dispersal, decreased or extirpated population, and long-term distribution changes.

Water

With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season and accelerating the rate at which the snowpack melts in the spring. The Sierra snowpack provides approximately 80% of California's annual water supply.

Napa County is subdivided by parallel northwest-trending mountain ridges into three principal watersheds: Napa River watershed, Putah Creek/Lake Berryessa watershed, and Suisun Creek watershed. The major aquifer in the County is the north Napa Valley groundwater basin. Domestic, commercial, and industrial water is derived from surface water (53%), including significant supplies from the State Water Project and groundwater (47%).⁵ Climate change is projected to impact the amount and type of water supply in California. Consequentially, Napa County may not be able to rely on past water sources.

Drought, Wildfires and Flooding

Natural disasters such as droughts, wildfires and flooding can be instigated by temperature and precipitation changes. Currently precipitation varies significantly throughout Napa County, with annual precipitation ranging from 22.5 to 75 inches per year.

Climate models predict a 4°F temperature increase in the next 20 to 40 years, with an increase in the number of long dry spells, as well as a 20-30% increase in precipitation in

⁵ Napa County Baseline Data Report, Chapter 15 Surface Water Hydrology, November 30, 2005.

the spring and fall. Intense storms can cause flooding and mudslides, resulting in potentially costly damages to property, infrastructure and even human life in Napa County.

Fluctuating weather patterns and rising temperatures resulting from climate change may change the frequency and intensity of droughts in the region and state. Consequentially, water supplies may be stressed, requiring flexibility and robustness to be built into water supply systems.

In addition, an increase in wildfires due to continued dry periods and high temperatures is another expected impact of climate change.

Public Health

Warming temperatures and changes in precipitation resulting from climate change can also encourage mosquito breeding and the diseases that come with mosquitoes, such as the West Nile Virus, a disease of growing concern in the Napa region.

Fluctuating seasons and temperatures could result in more extreme heat waves and cold spells in Napa County. Heat waves are expected to have a major impact on public health and be a determining factor of mortality. Extreme temperatures could affect the health of vulnerable residents in Napa, such as senior and youth populations.

Climate Protection Efforts

In response to the threat of climate change, communities worldwide are voluntarily reducing greenhouse gas emissions. The Kyoto Protocol, an international effort to coordinate mandated reductions, went into effect in February 2005 with 161 countries participating. While there are a growing number of nations committed to the Kyoto Protocol, as of October 2009 the United States is the only major industrialized country that has not signed the Protocol.

The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body established by the World Meteorological Organization and by the United Nations Environmental Programme. The IPCC was established to provide decision-makers with an objective source of information about climate change. The IPCC has called the evidence of the impacts of GHG on the world's climate "unequivocal."⁶

By April 2008, all six local governments in Napa County committed to becoming members of the ICLEI – Local Governments for Sustainability, an association of more than 1,105 national and regional and local government organizations worldwide that have made a commitment to sustainable development and that share information. Napa's local governments are also participating in the development of this Napa Countywide Community Climate Action Plan sponsored by the Napa County Transportation and Planning Agency (NCTPA) and funded by the Bay Area Air Quality Management District (BAAQMD).

⁶ Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report: "Climate Change 2007"

Existing Napa Climate Protection Programs

Over the last several years, local governments and organizations in Napa County have taken actions to reduce GHG emissions and improve energy efficiency in the County.

Examples of these include:

- The City of Napa’s long-term water management strategy commits the city to implementing the appropriate best management processes to ensure future supply reliability.
- The City of Napa recently adopted the county’s first green building code to cut energy and water usage.
- The City of Napa leads the State in electronics recycling; the City of Napa, Napa Recycling and Waste Services (NRWS) and local residents and businesses did their part for the environment by collecting over 65 tons of unwanted computer monitors, televisions, cell phones and other electronic waste for proper reuse and/or recycling.
- Napa County General Plan sets a concrete goal for the year 2030 of reducing 50% the number of work trips in private automobiles.
- City of St. Helena’s General Plan Update’s Climate Change Element includes goals, policies and programs aimed at significantly reducing GHG emissions in the city.
- The City of St. Helena and the Climate Protection Task Force is in the process of developing a Climate Action Plan for the city that supports the Climate Change Element and this Napa Countywide Community Climate Action Plan.
- Over 60 businesses in Napa County have qualified as a Bay Area Green Business through a regional program hosted by Napa County and NCTPA.
- The Napa River Watershed Management Plan includes sound objectives and actions to revitalize and repair the degraded Napa River Watershed, altering the drainage system to withstand flooding in the area and implementing habitat restoration efforts.
- The Napa County Sheriff’s Department headquarters is an environmentally-friendly government building, using materials, heating and cooling systems that reduce energy consumption and unnecessary reliance on natural resources.
- The Napa wine industry has already shown strong leadership in transitioning to renewable energy sources, preventing pollution, conserving resources, and complying with environmental standards. Napa Sustainable Winegrowers Group is dedicated to promoting sustainable farming practices including natural farming, Integrated Pest Management (IPM), pesticide reduction or elimination and, restoration of natural habitats on vineyard properties.
- Napa Valley Vintners “Napa Green Winery” certification program recognizes thirty-nine Napa wineries for their water and energy conservation, pollution prevention and solid waste reduction efforts. “Napa Green Land” includes over 33,000 acres of farmed and unfarmed land in Napa with the intention to restore, protect, and enhance the regional watershed.
- The City of Napa’s \$40 million water treatment plant upgrade in Jamieson Canyon improved the energy efficiency of the facility.

- Napa County enforces strict regulations on soil erosion and development of open land, limiting destruction caused by soil runoff and development of unstable, steep or otherwise unsuitable lands.
- Sustainable Napa County, a non-profit organization, funded energy audits for local nonprofit agencies, hosts education sessions to help cities and the building industry learn about new ordinances that promote energy efficiency in new development.
- The Napa Valley Recycling Environmental Awareness Team and the Napa County Green Party offers awards recognizing businesses' efforts to undertake sustainable practices in Napa County.
- The Land Trust of Napa County works with jurisdictions to protect open space land in the county.
- Napa Green, part of the Napa County Farm Bureau, hosts the Certified Land/Fish Friendly Farming Program, which is a voluntary program for grape growers and vintners that enhances the watershed and restores habitat with sustainable agriculture practices.
- Napa Valley College is home to a massive solar field, using technology that allows the panels to turn slowly with the arc of the sun to capture as much solar power as possible.

Climate Protection Co-Benefits

More than just reducing carbon emissions, climate protection will yield other important benefits for Napa County residents.

Support the Local Economy

Shifting to a low-carbon future provides local jobs for residents, and supports local businesses. Napa also has potential to develop new renewable energy sources within the County. Hundreds of jobs may be created once the identified actions are underway. Retrofitting buildings, for example, results in the creation of local employment opportunities for community members. Acting to reduce travel distances encourages support of local and neighborhood businesses.

Save Money

Most of the actions in this plan are cost-effective and, in fact, are improvements that will pay for themselves. For example, retrofitting residential units and commercial space saves energy costs. Low-income families spend up to 20 percent of their income on energy costs. For these families, the energy cost savings are particularly valuable.

In the same way, energy-efficient actions for waste and water facilities will result in additional energy cost savings.

Support a Healthy Living Environment

Every day, community members and visitors of the cities and County of Napa travel to a variety of places—they commute to work, drive to the store, go to the doctor, go out for dinner and visit wineries. Currently 53% of the countywide GHG emissions are produced by the transportation sector. To lower emissions, a high-quality transportation system must

include a mix of convenient public transit, bicycling, walking, car sharing, energy-efficient vehicles and the development of transit-oriented neighborhoods.

Actions in this plan support the development of healthy urban centers that are walkable and bikeable, include a variety of neighborhood-serving services and goods, and provide public transit options. Actions will also support the protection and preservation of Napa’s agricultural lands and significant natural resources.

Develop Local Energy Resilience

As greater demands are placed on our system of energy generation and supply, vulnerabilities become more apparent. To be more secure, local communities can be more efficient and move to renewable power sources. Napa County homes and businesses receive power purchased from the larger regional grid of power plants, which include coal, natural gas and nuclear power. Upgrading or repowering these plants could yield substantial reductions.

As new power plants replace the old ones, it is essential that they be built to high standards for efficient operations. It also is important to improve the efficiency of existing electricity generation plants in the region that supply power to the cities and County of Napa. These actions together could drop greenhouse gas emissions significantly.

Improve Air Quality

Climate protection actions clean polluted air—reducing carbon monoxide, sulfur dioxide, benzene, and particulates— which contributes to a healthy environment locally and regionally.

Napa as a Model

Napa County can expand its international reputation by serving as a model for jurisdictions worldwide by taking a collaborative, regional approach to fighting local emissions with targeted policies and actions, building on existing efforts countywide. In Napa County, businesses have already achieved huge gains in energy efficiency; environmental organizations have helped businesses and government to craft innovative green policies; schools have incorporated environmentally friendly practices in their facilities and programs; and foundations have funded many of these efforts. Residents do their share as well, taking numerous actions inside and outside their homes.

Five-Step Planning Process

To develop the Plan, Napa jurisdictions followed the “Five-Step Milestone Process” developed by ICLEI. This step-by-step process provides communities with a way to address a global problem at the local level—by adopting practices and policies to reduce GHG emissions, improve air quality, and enhance community livability and economic vitality.

Step 1: Baseline Emissions Inventory and Forecast

The County and cities of Napa completed a countywide inventory of Napa County GHG emissions in March 2009, which was refined in August 2009. The inventory included GHG emissions from the following sectors:

- Transportation
- Electricity and natural gas
- Solid waste
- Agriculture

Step 2: Emissions and Reduction Targets

Underlying GHG emissions reduction targets is the need to meet the scientific imperative, the goal dictated by current scientific evidence to ensure that human societies remain in balance with the abilities of natural systems to sustain them. With the passage of AB 32, California communities can now leap over the process of setting local targets by adopting the State's target as their own. This has the benefit of harmonizing local goals with state goals. Additionally, communities can advance more quickly to climate protection planning and implementation. GHG emissions inventories for Napa cities and the County completed in March 2009 used 2005 as the baseline year, and matched Napa's GHG reduction target with that of the State. Specific formal GHG reduction targets for the Bay Area region (and all of California's regions) are currently (November 2009) under development by the California Air Resources Board, as provided for in AB 32. How those state-mandated regional reductions will be allocated locally is also still under consideration.

Step 3: Local Action Plans

Climate Action Plans such as this one detail the specific actions to be pursued and the emissions reductions necessary to meet the target (see “High-Leverage, High-Impact Actions” below for how the actions were developed). This is not an exhaustive list of every effort that the cities and County should undertake to achieve the 2020 objectives; they might do much more.

Step 4: Implement Policies and Measures

Major efforts are already underway in Napa County to reduce emissions. All cities and the County are considering and/or have implemented energy efficiency programs, along with programs to generate energy through solar power and other renewables. Similarly, many other local agencies, businesses, and schools have embarked on programs to reduce GHG emissions. Successfully implementing the objectives and actions in this Climate Action Plan will require many diverse partners, including non-profit organizations, business leaders, neighborhood associations and individual residents.

Step 5: Monitor and Verify Results

This Climate Action Plan is a foundation that will be revised and built upon in the years to come. Reduction strategies and actions will continue to evolve as new climate-related technology, policy, best practices and resources become available.

High-Impact, High-Leverage Actions

The role of this Plan is to identify actions that yield both the highest impact and the highest leverage effects on Napa County’s GHG emissions. High-impact actions are those proven to produce the greatest GHG emission reductions in the shortest time period.⁷ High-leverage actions are those that Napa County is best positioned to accomplish. Combined, they lead to the “Six Strategies for GHG Reduction.”

Four criteria used to evaluate and develop high priority actions for this Plan include:

1. Is it under local control?
2. Will it lead to significant GHG emission reductions?
3. Is it cost-effective?
4. Is it politically feasible?

⁷ The high-impact actions were analyzed using a Carbon Model customized for this Plan (see Appendix D). The Napa Carbon Model is a mathematical representation of all of the significant sources of direct and indirect CO₂ emissions in Napa County, and the quantity of emissions from each source. The model represents emissions impacts in categories referred to as “opportunities for intervention.” To quantify the impacts of the actions in this plan, therefore, the actions had to be grouped according to the appropriate opportunity for intervention.

1. Under Local Control

The easiest filter to apply for potential Napa County actions is whether the action is under local control. All proposed actions in this Plan can be implemented by Napa local governments, businesses or individuals.

It is important to note, however, that not all sources of climate change are under local authority; neither are all actions for addressing the sources. For example, Napa local governments do not control fuel efficiency standards for vehicles even through these standards greatly impact local production of GHG emissions. A brief discussion of jurisdictional levels—local, regional, state, national, and international—and their relative power to reduce GHG emissions is offered in this Plan’s appendix. The conclusion is: local communities committed to achieving local GHG emission reduction targets must invest resources in advocating for change at regional, state and national levels. Although not the focus of this Plan, this conclusion points to an important topic for future consideration by Napa County leaders.⁸

2. Significant GHG Emission Reductions

To achieve the highest level of reductions the most rapidly, Napa County’s largest sources of emissions were considered (see section titled “Napa’s Carbon Footprint”).

To assess the impacts of these major actions, the Climate Protection Campaign’s Carbon Model was adapted to the data and conditions that exist in Napa County.⁹ The model is a mathematical representation of “opportunities for intervention” and was used to evaluate the cost effectiveness of a set of sector-specific measures, resulting in a bottom-line carbon reduction per dollar invested value for the major sectors addressed in this Plan.

The Carbon Model is composed of several sub-models:

- Transportation—models the effect on carbon emissions from changes in our transportation system. Measures that are modeled include mode share shift,¹⁰ land use change and non-emitting vehicle use.
- Electricity and natural gas end use—models the effect of efficiency improvements on end uses of electricity and natural gas in the residential and commercial sectors.
- Electricity fuel mix—estimates the effect of changing the percentage of non-emitting electricity generation sources used to produce electricity supplied on the grid. Non-emitting sources could include renewable energy like wind, solar and geothermal.

Also, opt-out actions—those actions that are implemented unless a customer explicitly declines an offered service or measure—were favored over those that are opt-in because of the higher level of adoption rate with opt-out measures. The higher the adoption rate, the greater are the reductions in energy demand and GHG emissions. Opt-in actions generally rely on costly marketing efforts to achieve significant results. Opt-out actions help ensure that actions are deployed at the widespread scale needed.

⁸ Appendix F: Need for Local Community to Invest in Advocacy

⁹ Appendix D: Carbon Model

¹⁰ Mode share is the percentage of total transportation miles that are accomplished using each mode of transportation (e.g., walking, bicycling, driving, or use of public transportation). Shift is the percent of change from one mode to another.

There are typically several well-observed barriers to affecting individual behavior modification that results in substantial GHG reductions—especially in the short run. Some of these barriers include the perception that conservation involves sacrifice, that investing in efficiency “isn’t worth it,” or that there’s nothing any single person can do, etc. Thus, the approach to analyzing the high priority actions did not focus on behavioral change, but rather analyzed the “value proposition” of these actions. This approach will better support ongoing public education, community engagement and decision-making.

And finally, the analysis included the political and institutional challenges posed by the Community Choice Aggregation (CCA) law (AB 117) that helps local communities cost-effectively control and purchase renewable electricity for its residents and businesses.

3. Cost-Effective

The cost to implement the recommended actions was estimated, to the extent possible. In many cases, thorough economic analyses exceeded the bounds of this study, as did an economic analysis of the impact on the County of the package of all proposed actions.

The hierarchy used in evaluating cost effectiveness for reducing GHG emissions (i.e., net cost per ton of carbon avoided, in order of most to least cost-effective) is as follows¹¹:

1. Conservation including demand reduction
2. Energy efficiency
3. Renewable, distributed, and localized energy sources
4. Carbon offsets¹² as a last resort when other options are not feasible

Within each level of the hierarchy, the cost-effectiveness of each action is maximized by:

- Using the best available technology
- Using the lowest cost capital for financing
- Lowering or removing the initial capital barrier
- Capturing the created revenue stream for repayment of financed costs
- Continuing to move up the supply curve for this measure until marginal cost is equal to lowest marginal cost of next level in the hierarchy

Using this approach minimizes the cost per ton of GHG reduced. The lifecycle cost of the measures is the net present value (NPV) of the investment with savings from reduction in fuel cost as an income stream.

The approach taken by this plan for each sector is as follows:

¹¹ This hierarchy parallels the ranking for efficiency measures or “loading order” adopted by the California Energy Commission, “Implementing California’s Loading Order for Electricity Resources,” California Energy Commission, 2005, <http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF>

¹² Carbon offsets are a financial instrument aimed at a reduction in greenhouse gas emissions. Carbon offsets are measured in metric tons of carbon dioxide equivalent. One carbon offset represents the reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases.

1. Identify the end uses or activities that that account for 80 percent or more of emissions
2. Apply the loading order¹³ analysis to reduce emissions at the minimum cost
3. Identify an optimal financing structure to produce the lowest lifecycle cost of the total set of measures

4. Politically Feasible

Political feasibility is a function of priorities and public will. When perceptions of risks and benefits shift, action follows. The abolition of slavery, human rights, and universal suffrage demonstrate how grand change happens through time. As well, mobilization for change can happen quickly when seemingly impossible action suddenly becomes mandatory. The political context for climate protection is changing rapidly as knowledge and awareness of the climate crisis accelerates daily, as does the conviction that strong action must be taken not only for ourselves but also for our children and our children's children.

Comprehensive Actions

As a result of using these four criteria, the actions outlined in this plan identify ways to:

- Lower economic barriers to adoption of high performance energy efficiency measures;
- Develop cost-effective ways to transition to electricity and heating/cooling from renewable, non-emitting energy sources;
- Create cost-effective and convenient automobile alternatives by promoting the development of less carbon intense or non-carbon emitting transportation modes;
- Develop land use policies to minimize GHG emissions;
- Redesign municipal services to emphasize demand reduction;
- Change agricultural and forestry practices to further reduce carbon impact; and
- Adopt the lowest cost financing methods to replace fossil fuel-based energy with renewables.

Proposed Ongoing Evaluation of this Plan

The suggestions below for evaluating Plan implementation and adapting it based on new data and analysis are derived from other Climate Action Plans. These suggestions must be further discussed by the local jurisdictions and regional agencies to determine the best

¹³ The loading order was developed by California's principal energy agencies to guide energy decisions according to cost effectiveness. It prioritizes decreasing electricity demand by increasing energy efficiency and demand response, and meeting new generation needs first with renewable and distributed generation resources, and second with clean fossil-fueled generation. The loading order was adopted in the 2003 Energy Action Plan prepared by the energy agencies and the Energy Commission's 2003 Integrated Energy Policy Report (2003 Energy Report) used the loading order as the foundation for its recommended energy policies and decisions, <http://www.energy.ca.gov/2005publications/CEC-400-2005-043/CEC-400-2005-043.PDF>

course of action for countywide implementation that also meets the regulatory and reporting needs of each jurisdiction or agency. The planning environment for evaluating these actions and others that include transportation and land use carbon reduction strategies is becoming more complex and inter-related and is evolving quickly.¹⁴

Every Year

Report annually on local carbon emission trends, fossil fuel use and progress in implementing the actions in this Climate Action Plan. Additional data on consumption will be included in the report as it becomes available.

Every Three Years: New Actions

Every three years, revise the actions in this plan and identify new ones as necessary. During this periodic review, the cities and County and other planning agencies will determine whether actions that have not yet been implemented nonetheless remain effective ways to achieve the objectives of this plan, and will develop new actions to be implemented in the subsequent three years.

2020: Develop 2050 Plan

The Plan will be re-examined in 2020, based on the latest science and the successes and challenges of implementing policies and programs. A new countywide climate action plan will have 2035 interim goals and objectives to keep the cities and County of Napa on a path to achieve the 80% reduction in carbon emissions and to meet the challenges of preparing for a changing climate.

¹⁴ See Appendix I: SB375 Carbon Reductions through Transportation and Land Use Planning.

Napa's Carbon Footprint¹⁵

ICLEI – Local Governments for Sustainability and the Bay Area Air Quality Management District (BAAQMD) hosted a technical workshop at the Napa County Transportation and Planning Agency (NCTPA) for the purpose of generating preliminary greenhouse gas (GHG) baseline emissions inventories for all six Napa County jurisdictions. Staff from all six Napa County jurisdictions were present and participated in the development of the Napa countywide community carbon footprint. The results from this inventory were validated and refined by the technical consultants at the Climate Protection Campaign.

GHG Emissions Inventory

The baseline inventory was produced by ICLEI in partnership with the Napa County Climate Action Plan consultants (MIG and the Climate Protection Campaign) and staff from NCTPA and all six Napa County jurisdictions. The purpose of the baseline emissions inventory is to determine the levels of greenhouse gas emissions emitted in Napa County in 2005, the established base year for analysis and forecasting.

ICLEI's Cities for Climate Protection inventory methodology allows local governments to systematically estimate and track greenhouse gas emissions from transportation, energy and waste related activities at the community-wide scale.

Once completed, these inventories provide the basis for creating an emissions forecast and reduction target, and enable the quantification of emissions reductions associated with implemented and proposed measures.

GHG Emissions Analysis Software

To facilitate local government efforts to identify and reduce greenhouse gas emissions, ICLEI developed the Clean Air and Climate Protection (CACP) software package. This software estimates emissions derived from energy consumption and waste generation within a community. The CACP software determines emissions using specific factors (or coefficients) according to the type of fuel used. Emissions are aggregated and reported in terms of carbon dioxide equivalent units, or CO₂e. Converting all emissions to carbon dioxide equivalent units allows for the consideration of different greenhouse gases in comparable terms. For example, methane is twenty-one times more powerful than carbon dioxide in its capacity to trap heat, so the model converts one ton of methane emissions to 21 tons of CO₂e.

The emissions coefficients and methodology employed by the software are consistent with national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the US Voluntary Greenhouse Gas Reporting Guidelines (EIA Form 1605), and, for emissions generated from solid waste, the US EPA's Waste Reduction Model (WARM).

¹⁵ See Appendix B for consolidated countywide carbon footprint.

The CACP software has been and continues to be used by over 250 US local governments to reduce their greenhouse gas emissions. However, it is worth noting that, although the software provides all Napa County jurisdictions with a sophisticated and useful tool, calculating emissions from energy use with precision is difficult. *The model depends upon numerous assumptions, and it is limited by the quantity and quality of available data. With this in mind, it is useful to think of any specific number generated by the model as an approximation rather than an exact value.*

GHG Emissions Inventory Data Sources

An inventory of greenhouse gas emissions requires the collection of information from a variety of sectors and sources. Here is a brief summary of the data sources. (For an in-depth review of data sources, methods and protocols used to compute the GHG emissions please see Appendix C, “Methodology—ICLEI.”)

Built Environment: Residential, Commercial and Industrial Sectors

Data Sources

- Utility electricity and natural gas consumption for 2005 was provided by PG&E. Data is reported at an aggregate level for each sector – Residential, Commercial and Industrial.¹⁶
- Countywide Direct Access electricity consumption (purchased directly from the power generator, not through PG&E) for Napa County was obtained from the California Energy Commission.

What is not included in this data?

- Fuel sources not delivered by PG&E. For example, wood, charcoal, propane, kerosene, diesel, heavy fuel oil, etc. In California, this largely results in an exclusion of industrial process emissions, not a factor in Napa County.
- Perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulfur hexafluoride (SF₆). This data is typically prohibitively difficult to obtain.

Waste Sector

Data Sources

- **Landfill Emissions:** total captured and fugitive emissions (methane emissions) released from any landfills located in each jurisdiction in the baseline year
- **Lifetime Decomposition Associated with Waste Generated:** total emissions (methane emissions) from solid waste generated in each jurisdiction in the baseline year that was sent to landfills, regardless of whether they are located within or outside of each jurisdiction’s boundaries.

¹⁶ Commercial and Industrial are often bundled together. Industrial customers are subject to State PUC confidentiality laws—15/15 rule—if they consume a certain proportion of the electricity within the local government. Consequentially, all Napa County jurisdictions had at least a portion of the industrial consumption reported in the commercial sector, and any reported emissions from the industrial sector constitute only a subset of actual industrial emissions.

- Total emissions (methane emissions) from the Alternative Daily Cover (ADC) used in the landfills where the waste generated in each jurisdiction is disposed.

What is not included in this data?

- Any GHG emissions considered to be biogenic in origin¹⁷ are not included in this data.

Transportation/Mobile Emissions Sector

Data Sources

- Local Roads 2005 Vehicle Miles Traveled (VMT) data was obtained from Caltrans, which compiles and publishes statewide VMT data annually through the Highway Performance Monitoring System.¹⁸ Caltrans obtains VMT data on local roads from regional transportation planning agencies and councils of governments across the state. For the San Francisco Bay Area, Caltrans obtains data from the Metropolitan Transportation Commission (MTC). MTC obtains VMT data on local roads either from the local governments within its jurisdiction or, if that data is unavailable, through a Caltrans model. Since this data reports all travel on roads in Napa County, it includes trips that neither originate nor end in Napa. This “pass through” travel is projected to be a growing portion of local road volume, especially in the southern part of the county and the city of American Canyon. Thus a potentially significant portion of the projected growth in transportation sector GHG emissions represents growth in our neighboring counties. This highlights the fact that Napa’s GHG reduction strategies exist within an active ongoing region-wide reduction effort.
- State Highways Vehicle Miles Traveled (VMT) 2005 data was also obtained from Caltrans, with daily VMT by road segment.
- Off-road non-point source emissions were obtained by the California Air Resources Board.

What is not included in this data?

- Emissions associated with port or airport operations
- Rail transit emissions
- This methodology will not reflect the use of any fuels besides gasoline and diesel
- Perfluorocarbons (PFCs), Hydrofluorocarbons (HFCs), Sulfur Hexafluoride (SF₆). This data is typically prohibitively difficult to obtain.

In short, after some initial manipulation of the raw data from these sources, these data were entered into the CCAP software to generate a community emissions inventory. The community inventory represents an estimated overview of the energy used and waste produced within Napa County and its contribution to greenhouse gas emissions.

The community-scale Napa County inventory is based on the year 2005. When calculating the emissions inventory, all energy consumed in Napa County was included. This means that, even though the electricity used by local residents is produced elsewhere, this energy

¹⁷ A biogenic substance is produced by life processes including greenhouse gas emissions from fossil-based products (incineration or decomposition) and from organic waste handling and decay.

¹⁸ The 2005 report is available at:
<http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2005PRD.pdf>.

and emissions associated with it is accounted for in this inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community.

2005 Napa Countywide Community Emissions by Jurisdiction

Jurisdiction	2005 Emissions (metric tons of CO2 equivalents)	% of Total
Yountville	28,305	2%
Calistoga	28,427	2%
St. Helena	46,052	4%
American Canyon	91,449	8%
City of Napa	455,062	38%
Unincorporated Napa County	550,986	46%
TOTAL 2005 NAPA COUNTYWIDE EMISSIONS	1,200,281	

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Call out box: Together Unincorporated Napa County and the City of Napa **comprise 84% of countywide GHG emissions.**

2005 Napa Countywide Per Capita Emissions by Jurisdiction

Jurisdiction	2005 Emissions (metric tons of CO2 equivalents)	2005 Population	Per Capita Emissions
Yountville	28,305	3,400	8.33
Calistoga	28,427	5,200	5.47
St. Helena	46,052	6,100	7.55
American Canyon	91,449	14,200	6.44
City of Napa	455,062	76,600	5.94
Unincorporated Napa County*	550,986	28,600	19.27
TOTAL	1,200,281	134,100	8.95

* The relatively high Unincorporated Napa County per capita emissions result from an ICLEI inventory methodology that attributes regional transportation emissions based on where they occur rather than where the trip originates or ends. This methodology is consistent for

all jurisdictions but impacts the unincorporated area most due to the major highways in the incorporated area.

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2005 Napa Countywide Community Emissions by Sector

Sector	2005 Emissions (metric tons of CO2 equivalents)	% of Total
Residential Buildings	196,350	16%
Commercial & Industrial Buildings	226,661	19%
Transportation	636,724	53%
Lawn & Garden Equipment	3,616	0%
Construction & Industrial/Commercial Equipment	49,675	4%
Agriculture/Farming	33,046	3%
Solid Waste	54,209	5%
TOTAL 2005 NAPA COUNTYWIDE EMISSIONS	1,200,281	

<show pie chart>

Call out box: The greatest opportunities for reduction are in the transportation and building sectors, because they constitute 53% and 35% of the countywide GHG emissions.

2005 Napa Countywide Community Emissions by Source

Source	2005 Emissions (metric tons of CO2 equivalents)	% of Total
Electricity	207,962	19%
Natural Gas	190,513	17%
Transportation Fuels	636,724	57%
Agriculture/Farming	33,046	3%
Solid Waste	54,209	5%
TOTAL 2005 NAPA COUNTYWIDE EMISSIONS*	1,122,454	

* Source total is different than sector and jurisdiction total, because it does not include data from lawn and garden equipment, construction & industrial/commercial equipment and electricity and natural gas use from suppliers other than PG&E.

2020 GHG Emissions Forecast

Forecasting emissions to a projected target year (most often 2020) is done to create a more accurate picture of the emission reductions necessary to meet desired targets. Because of population increase, as well as growth in the jobs and transportation sectors, emissions will experience a background change not related to policy changes made by the local government. When creating an emissions reduction target, it is therefore important to consider not only emissions in the base year, but projected emissions in the target year, as these will need to be accounted for in the policies and measures taken to reduce GHG emissions in Napa County.

The 2020 GHG emissions estimates are based on household, population, and job forecasts from ABAG’s policy-based *Projections 2005*. The ABAG 2005 growth projections have been revised downward slightly for 2009; however, since 2005 was used as the baseline year, this same year was used for forecasting.

The compounded annual growth rate of 1.509% for the transportation sector is a statewide projection derived from the California Energy Commission report titled “Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report.” Over the 15-year forecast period, this projected annual growth rate results in a 25% increase in transportation emissions forecasted for 2020.

Please note the forecasted growth in GHG emissions assumes that **no actions** are taken to reduce emissions. In other words, this forecast does not consider the reduction impacts from the actions contained in this Plan.

2020 Napa Countywide Community Emissions Forecast by Jurisdiction

Jurisdiction	2005 Emissions (metric tons)	2020 Emissions (metric tons)	% Increase 2005 to 2020
Yountville	28,305	31,924	13%
Calistoga	28,427	31,480	11%
St. Helena	46,052	49,541	8%
American Canyon*	91,449	152,393	67%
City of Napa	455,062	544,572	20%
Unincorporated Napa County	550,986	656,989	19%
TOTAL	1,200,281	1,466,900	22%

* The relatively high growth in GHG emissions for American Canyon is the result of ABAG projections that show high anticipated growth in the number of jobs and households between 2005 and 2020.

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2020 Napa Countywide Community Emissions Forecast by Sector

Sector	2005 Emissions (metric tons)	2020 Emissions (metric tons)	% Increase 2005 to 2020
Residential Buildings	196,350	219,924	12%
Commercial & Industrial Buildings	226,661	292,783	29%
Transportation	636,724	797,054	25%
Lawn & Garden Equipment	3,616	4,053	12%
Construction & Industrial/Commercial Equipment	49,675	59,839	20%
Agriculture/Farming	33,046	33,046	0%
Solid Waste	54,209	60,201	11%
TOTAL	1,200,281	1,466,900	22%

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2020 Napa Countywide Community Emissions Forecast for each Jurisdiction

American Canyon

American Canyon’s communitywide emissions are expected to increase by 67% by 2020 due primarily to ABAG projected job growth of 2,410 jobs in 2005 to 6,590 jobs in 2020. As noted earlier, this forecast assumes a business as usual or do nothing scenario. To the extent that the commercial and industrial buildings use renewable energy and are highly energy efficient, this anticipated growth in emissions can be significantly reduced. Furthermore, if these new jobs go to local residents, it will reduce the vehicle miles traveled by residents and thereby reduce GHG emissions in the transportation sector. Also, as mentioned above, a significant portion of the transportation sector GHG emissions in American Canyon represent travel that neither originates nor ends in the City and therefore should be considered as an element of the countywide and region-wide reduction effort.

American Canyon	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	19,819	22%	27,393	38%
Commercial & Industrial Buildings	21,672	24%	59,261	173%
Transportation	40,479	44%	50,672	25%
Lawn & Garden Equipment	346	0%	478	38%
Construction & Industrial/Commercial Equipment	1,660	2%	4,539	173%
Agriculture/Farming	4	0%	4	0%
Solid Waste	7,469	8%	10,046	35%
TOTAL	91,449		152,393	67%

Calistoga

Calistoga’s communitywide emissions are expected to increase by a relatively small 11% by 2020. Also, given that 52% of Calistoga’s current emissions are due to existing buildings, Calistoga’s initial priority actions are to implement policies and programs that make these buildings more energy efficient and explore financing opportunities that make switching to renewable energy alternatives more attractive.

Calistoga	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	7,758	27%	8,022	3%
Commercial & Industrial Buildings	7,062	25%	7,486	6%
Transportation	8,704	31%	10,896	25%
Lawn & Garden Equipment	151	1%	156	3%
Construction & Industrial/Commercial Equipment	1,949	7%	2,066	6%
Agriculture/Farming	132	0%	132	0%
Solid Waste	2,671	9%	2,722	2%
TOTAL	28,427		31,480	11%

City of Napa

Emissions in the City of Napa are projected to increase 24% percent between 2005 and 2020, with the majority of emissions growth occurring due to growth in jobs in the commercial and industrial sectors, from 35,260 in 2005 to 42,280 in 2020.

Given that 49% of the City of Napa’s current emissions are in the transportation sector, the City has focused its attention on both planning and policies that enhance urban-centered growth and encourage mixed use, live/work and “walkable”/“bikeable” neighborhoods. In addition, the City is seeking funding to improve the fuel efficiency of the public street system and developing parking strategies that reduce vehicle miles traveled. And, since building energy use represents 39% of the overall emissions, the City has adopted a green building ordinance and is working together with other jurisdictions in Napa County to provide attractive energy efficiency upgrade and renewable energy funding for property owners.

City of Napa	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	106,003	23%	117,765	11%
Commercial & Industrial Buildings	71,120	16%	85,279	20%
Transportation	221,901	49%	277,777	25%
Lawn & Garden Equipment	2,109	0%	2,343	11%
Construction & Industrial/Commercial Equipment	24,277	5%	29,110	20%
Agriculture/Farming	286	0%	286	0%
Solid Waste	29,366	6%	32,011	9%
TOTAL	455,062		562,486	24%

St. Helena

St. Helena community GHG emissions are projected to increase only 8 percent by 2020, the smallest percentage increase in Napa County. Given the very small increase in projected growth and that 61% of the current emissions are from building energy use, St. Helena’s focus is on implementing energy efficiency and renewable energy programs for existing residents and businesses.

St. Helena	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	10,781	23%	11,225	4%
Commercial & Industrial Buildings	17,458	38%	18,139	4%
Transportation	8,452	18%	10,580	25%
Lawn & Garden Equipment	178	0%	185	4%
Construction & Industrial/Commercial Equipment	4,061	9%	4,219	4%
Agriculture/Farming	769	2%	769	0%
Solid Waste	4,353	9%	4,424	2%
TOTAL	46,052		49,541	8%

Yountville

Yountville’s GHG emissions are projected to increase by only 13 percent between 2005 and 2020. Given this relatively small growth in emissions from new development and the fact that 63% of the Town’s emissions are from existing buildings, Yountville’s climate action focus is on making existing buildings more energy efficient and encouraging and enabling renewable energy for existing buildings.

Yountville	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	3,765	13%	4,288	14%
Commercial & Industrial Buildings	14,032	50%	15,019	7%
Transportation	7,424	26%	9,293	25%
Lawn & Garden Equipment	79	0%	90	14%
Construction & Industrial/Commercial Equipment	1,858	7%	1,989	7%
Agriculture/Farming	38	0%	38	0%
Solid Waste	1,109	4%	1,207	9%
TOTAL	28,305		31,924	13%

Unincorporated Napa County

The unincorporated area of Napa County has a projected growth of 19% in GHG emissions, due mostly to the very high percentage of transportation emissions attributed to the unincorporated area of Napa County. Given that these emissions are the result of intracounty travel among all local jurisdictions as well as regional transportation planning challenges, Napa County is engaged in working together with NCTPA to find regional solutions while working locally to maintain and improve the County's overall jobs to housing balance.

Unincorporated Napa County	2005 Emissions (metric tons)	% Total 2005 Emissions	2020 Emissions	% Increase 2005 to 2020
Residential Buildings	48,224	9%	51,232	6%
Commercial & Industrial Buildings	95,317	17%	107,599	13%
Transportation	349,764	63%	437,836	25%
Lawn & Garden Equipment	753	0%	800	6%
Construction & Industrial/Commercial Equipment	15,870	3%	17,915	13%
Agriculture/Farming	31,817	6%	31,817	0%
Solid Waste	9,241	2%	9,790	6%
TOTAL	550,986		656,989	19%

Policy Context for Local Climate Protection

The Climate Action Plan

Local government has an enormously important role to play in the achieving the greater long-term goal of preventing catastrophic climate change. The Napa Countywide Community Climate Action Plan will support existing Napa countywide values and visions as identified in existing jurisdiction policy documents.¹⁹ These include:

Promote Economic Sustainability

- Support a viable, thriving agricultural industry
- Promote locally-produced power
- Stimulate development of a specialized and skilled workforce (including energy services)
- Help businesses to conserve energy and renew resources

Promote Equal Access to Community Resources

- Support non-vehicle access to parks, schools, grocery stores and medical services
- Support a transportation system that enables compact development

Promote Environmental Sustainability

- Promote efficient use of water, land, and energy resources
- Promote renewable resources as a primary energy source

Adaptation to Changing Climate

- Adapt to changes in the climate that have already happened
- Reduce the impact of the changes that can be expected

The Plan will guide future implementation and foster effective collaboration between government, business and community organizations toward achieving the GHG reduction targets.

General Plans

General Plans are composed of goals, objectives, policies, standards, and/or implementation measures, as well as a set of maps and diagrams that describe a vision for the community's future development. While renewable energy sources, cleaner fuels and green technology will help reduce GHG emissions, significant changes in how we design and construct our "built environment," as determined in General Plans, are also necessary.

GHG reduction policies can be incorporated into regional and local planning efforts, including each jurisdiction's General Plan. Policies can be incorporated into existing General Plan Elements (such as housing, land use, conservation, noise, circulation, open space, and

¹⁹ Napa County General Plan (2008), St. Helena General Plan (2009), City of Napa General Plan (2009), Calistoga General Plan (2003).

safety). The way the different elements interrelate is an important consideration when incorporating policies for GHGs in the General Plan, and ensuring that those policies are internally consistent throughout the Plan. Alternatively, climate change can be added as an entirely separate element, which gives it additional importance. The recently updated Napa County General Plan contains numerous significant references to climate protection and GHG reduction goals. The St. Helena General Plan, currently under revision, is projected to contain an innovative stand-alone Climate Change Element.

ICLEI—Local Governments for Sustainability

ICLEI has been a leader both internationally and domestically for more than ten years, representing over 770 local governments around the world. ICLEI was launched in the United States in 1995 and has grown to include more than 230 US cities and counties providing national leadership on climate protection and sustainable development. In June 2006, ICLEI launched the California Local Government Climate Task Force as a formal mechanism to provide ongoing input and collaboration into the State of California’s climate action process. ICLEI also works in conjunction with the US Conference of Mayors to track progress and implementation of the US Mayors Climate Protection Agreement, launched in 2005, which more than 376 mayors have signed to date, pledging to meet or beat the Kyoto Protocol emissions reduction target in their own communities.

Regional Efforts

To be effective, local planning efforts alternatives must be evaluated for consistency with regional plans. Four Bay Area agencies—the Bay Area Air Quality Management District, the Metropolitan Transportation Commission, the Association of Bay Area Governments, and the San Francisco Bay Conservation and Development Commission—have also formally made climate protection part of their agendas. Separately they are pursuing regulatory and incentive-based programs, and together through the Joint Policy Committee, chaired by Napa County Supervisor Bill Dodd, they are also forging a coordinated effort to reduce emissions throughout the region, particularly as related to transportation and land use policies.²⁰

Statewide Policies

State Reduction Targets for GHGs (Executive Order S-3-05)

The first comprehensive state policy to address climate change was established through an Executive Order of the Governor of California. In 2005, Governor Schwarzenegger issued California Executive Order S-3-05, which established ambitious GHG reduction targets for the state: reduce GHG emissions to 2000 levels by 2010, reduce to 1990 levels by 2020, and reduce emissions 80% below 1990 levels by 2050. These targets reflect the world-wide emission reduction trajectory identified by the International Panel on Climate Change (IPCC) as being necessary to avert catastrophic global climate change. Under the Executive Order, each state agency is directed to identify and pursue actions within their purview that could contribute to the necessary emission reductions.

²⁰ See Appendix I: SB375 Carbon Reductions through Transportation and Land Use Planning.

Global Warming Actions Act of 2006 (AB 32)

California AB 32, the “Global Warming Actions Act of 2006,” codifies the State’s GHG emissions target by directing the California Air Resources Board (CARB) to reduce the State’s global warming emissions to 1990 levels by 2020. CARB regulations must begin phasing in by 2012. AB 32 vests the principal authority to implement the program in the CARB, but provides that the Secretary of Cal/EPA will coordinate across state agencies. The cornerstone of the program is the development and adoption by CARB of a Scoping Plan that identifies specific reduction strategies, implementation mechanisms, and timelines. The CARB adopted the Scoping Plan in December of 2008, and regulations to implement the Plan’s strategies are currently in development for implementation by 2012.

Greenhouse Gas Emission Standards for Vehicles (AB 1493)

Passed in 2002, before the overarching climate program was established, AB 1493, authored by Assembly Member Fran Pavley and often referred to as “the Pavley Bill,” required CARB to develop and adopt the nation’s first GHG emission standards for automobiles, and the emission limits it requires are commonly referred to as the Pavley Standards. The CARB approved GHG emission limits for light duty vehicles in 2004. The standards become effective in 2009 and will reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016.

Although the federal government generally reserves the authority to establish tailpipe emission standards for motor vehicles, the federal Clean Air Act provides that California may establish such standards and the US EPA granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

Low Carbon Fuel Standard (Executive Order S-1-07)

In his January 2007 State of the State message, Governor Schwarzenegger established a Low Carbon Fuel Standard (LCFS) by Executive Order. This first-in-the-world greenhouse gas standard for transportation fuels will spark research in alternatives to oil and reduce GHG emissions. The LCFS calls for a reduction of at least 10 percent in the carbon intensity of California’s transportation fuels by 2020.

Renewable Energy Portfolio (SB 1078 and SB 107)

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California’s Renewable Portfolio Standard (RPS) obligates investor-owned utilities (IOUs), energy service providers (ESPs) and community choice aggregators (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. CARB’s Scoping Plan identifies a target RPS of 33% by 2020.

Improved Land Use Planning (SB 375)²¹

In September 2008, the Governor signed Senate Bill 375. This bill has five main provisions.

²¹ See Appendix I: SB375 Carbon Reductions through Transportation and Land Use Planning.

1. Creation of regional targets for GHG emissions reduction tied to land use (and therefore driving patterns).
2. A requirement that regional planning agencies create a plan to meet those targets, even if that plan is in conflict with local plans.
3. A requirement that regional transportation funding decisions be consistent with this new plan.
4. Tethering together regional transportation planning and housing efforts for the first time.
5. New CEQA exemptions and streamlining for development projects that conform to the new regional plans, even if they conflict with local plans.

Indirect Source Rule for CO2

The Bay Area Air Quality Management District (Air District) is initiating development of an Indirect Source Review Rule (ISR) to address the adverse impacts of growth on local and regional air quality as well as address the impacts of growth on our climate. Indirect sources are development projects that generate or attract motor vehicle trips and emissions and also include other sources of emissions, such as fireplaces, home heating and cooling, and landscape maintenance equipment, which indirectly cause air pollution. The Air District anticipates proposing an Indirect Source Review Rule for consideration by the District Board of Directors in 2010 and is also proposing to assess administrative and mitigation fees associated with its implementation.

Alternative and Renewable Fuel & Vehicle Technology Program (AB 118)

In October 2007, Governor Schwarzenegger signed AB 118 into law. AB 118 provides approximately \$200 million annually through 2015 for three new programs to fund air quality improvement projects and develop and deploy technology and alternative and renewable fuels. The bill creates a dedicated revenue stream for the programs via increases to the smog abatement, vehicle registration and vessel registration fees. The three new programs are: the Air Quality Improvement Program administered by CARB, the Alternative and Renewable Fuel and Vehicle Technology Program administered by the California Energy Commission, and the Enhanced Fleet Modernization Program administered by the Bureau of Automotive Repair.

California Energy Efficiency Standards (Title 24, Chapter 6)

Title 24, Part 6 (California's Energy Efficiency Standards for Residential and Nonresidential Buildings) of the California Code of Regulations was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and incorporation of new energy efficiency technologies and methods. These standards are mandatory and thus new building permitted by City and County governments must comply with the standards in effect at the time. These standards also promote cost-effective means to reduce energy use and thus GHG emissions for new development relative to business-as-usual conditions.

The Energy Commission adopted the 2008 Standards in April 2008, and became effective in August 2009.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) is not specific to GHG regulation and does not create specific new mandates for General Plans; however, its basic goal is to ensure that environmental impacts of proposed projects are evaluated, and significant impacts are mitigated and disclosed to the public.

CEQA substantially influences the approval process for General Plans. The evaluation is done through an Environmental Impact Report (EIR) which provides State and local agencies and the general public with detailed information on potentially significant environmental impacts a proposed project is likely to have and ways to mitigate those impacts, and also information on how to evaluate potential alternatives to the project.

On January 1, 2010, the California Natural Resources Agency is expected to approve a series of amendments to the CEQA Guidelines. The proposed amendments contain recommended changes to fourteen sections of the existing guidelines, including: the determination of significance as well as thresholds; statements of overriding consideration; mitigation; cumulative impacts; and specific streamlining approaches.

The amended Guidelines require local agencies to quantify or describe the greenhouse gas (GHG) emissions of proposed projects and to mitigate GHG emissions when feasible. The Guidelines emphasize the importance of local greenhouse gas reduction plans (such as local climate action plans) as a means for both providing and streamlining CEQA review for projects. An agency may find a project's impact due to GHG less than significant if the project is consistent with a local climate action plan.

California Climate Adaptation Strategy

The State Department of Resources is finalizing a comprehensive plan to guide adaptation to climate change, recognizing that "climate change is already affecting California." The document summarizes the latest science on how climate change could impact the state, and provides recommendations on how to manage against those threats in seven sector areas.

Regionally, The Bay Conservation and Development Commission (BCDC) has released initial studies that will lead to an adaptation plan that includes a strategy for adapting to sea level rise in San Francisco Bay and the Suisun Marsh over the next 50 years.

National

As part of the national policy debate on climate change, the American Clean Energy and Security Act of 2009 was narrowly passed by the House of Representatives in June of this year. Also known as the Waxman-Markley comprehensive energy bill, it includes a cap-and-trade global warming reduction plan designed to reduce economy-wide greenhouse gas emissions by 17 percent by 2020. Other provisions include new renewable requirements for utilities, studies and incentives regarding new carbon capture and sequestration technologies, energy efficiency incentives for homes and buildings, and grants for green jobs, among other things.

Also in June of this year (2009) the US Government released its "Global Climate Change Impacts in the United States," compiling years of scientific research and new data not

available in previous large national and global assessments. It was produced by a consortium of experts from 13 US government science agencies and from several major universities and research institutes. Its production and review spanned both Republican and Democratic administrations.

Some key findings include:

- **Climate changes are underway in the United States and are projected to grow.** Climate-related changes are already observed in the United States and its coastal waters. These include increases in heavy downpours, rising temperature and sea level, rapidly retreating glaciers, thawing permafrost, lengthening growing seasons, lengthening ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows. These changes are projected to grow.
- **Crop and livestock production will be increasingly challenged.** Agriculture is considered one of the sectors most adaptable to changes in climate. However, increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.
- **Threats to human health will increase.** Health impacts of climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. Robust public health infrastructure can reduce the potential for negative impacts.

Global

As of the drafting of this report, world leaders are preparing to gather in Copenhagen this December to update the previous world accord on climate change, the “Kyoto Protocol” drafted in 1997. To date 184 countries have ratified the Kyoto agreement, representing over 63.9% of 1990 emissions. The most notable non-party to the Protocol is the United States, which was responsible for 36% of the global 1990 emission levels from industrial nations. The reductions for the US under the protocol were 7% below 1990, significantly less onerous than the reductions currently under consideration (up to 80% below 1990 levels according to California targets). Following preparatory talks in Bonn, Bangkok and Barcelona, the Copenhagen conference is expected to adopt the treaty succeeding the Kyoto Protocol.

The most recent international assessment of climate change caused by human activity, released in 2007, is the “Fourth Assessment” of the International Panel on Climate Change (IPCC), a scientific intergovernmental body tasked to evaluate the risk of climate change. The Fourth Assessment was produced by over 600 authors from 40 countries. Although the report is highly detailed and technical, its principal conclusions were that:

- Warming of the climate system is unequivocal. World temperatures could rise by between 2 and 11.5 ° during the 21st century; and
- Most of the observed increase in global average temperatures since the mid-20th century is very likely (with over 90% certainty) due to the observed increase in anthropogenic greenhouse gas concentrations.

The “Fifth Assessment” is currently under preparation and is due in 2014.

Six Goals for GHG Reductions

To reach the 2020 reduction target, the cities and the County of Napa will need to reduce GHG emissions countywide by 30 percent by 2020.

To achieve that 2020 target, Napa County must aggressively pursue reduction measures in every sector. For example, the transportation sector produces the greatest amount of Napa County's GHG emissions—approximately 55 percent. Ideally, emissions reduction strategies would yield the greatest results in this area. However, transportation is the sector least amenable to reduction actions, as discussed below. Thus to the extent that reductions are proportionally less in transportation due to the lack of available measures, short term *high-impact* opportunities in the electricity and natural gas sector must be pursued to compensate for transportation's shortfall, despite the fact that only about 36 percent of GHG emissions in Napa County come from electricity/natural gas. In the long term, reductions from all sectors will have to approach 80 percent by 2050 to meet the scientific imperative.

This document details six goals with 56 high-priority countywide actions intended to achieve the emissions goals. Staff from all Napa cities/towns and County participated in the drafting of the 56 countywide numbered actions outlined below. In addition, when appropriate, each jurisdiction provided additional local specificity regarding the development or implementation of a countywide action.

The Climate Action Plan's actions fall into six major goals:

1. **Expand Transportation and Mobility Options:** Shift transportation from fossil fuel vehicles to transit, walking, bicycling, and renewably powered vehicles and invest in Napa County jobs.
2. **Improve Buildings and Energy Efficiencies:** Invest in widespread energy and water efficiency to reduce demand; invest in Napa County renewable energy sources.
3. **Reduce Consumption and Solid Waste:** Significantly reduce the amount of waste produced in cities and the County.
4. **Conserve Agriculture, Natural Resources, and Urban Forests:** Protect our natural resources and farmland, and sequester carbon.
5. **Increase Community Engagement:** Market programs and conduct community outreach to increase participation in GHG reduction efforts.
6. **Improve Local Government Operations:** Lead by example by implementing policies and programs in jurisdiction operations and facilities.

The actions—to be implemented during the next three years—are not intended to be an exhaustive list of every effort that the cities and County of Napa will undertake to achieve the 2020 objectives; they may do much more. However, these actions identified are the highest priority countywide actions. Moreover, while the cities and County of Napa will have a major, direct role in carrying out many of the following objectives and actions, successful implementation will require many diverse partners, from non-profit organizations to business leaders to neighborhood associations to individual residents.

The Climate Action Plan includes goals for 2020, objectives and the actions needed to achieve these objectives. When implemented, these actions will enable the County and cities to meet the established emissions target.

Goal 1. Expand Transportation and Mobility Options (TM)

GHG emissions related to transportation account for 53% of the total countywide emissions and are the fastest growing source of GHG emissions in Napa County.

Nearly two out of three trips²² made in Napa County are by single occupant, fossil fuel powered automobiles. Approximately \$150 million²³ leaves the County per year as payment for the fossil fuel that powers our vehicles. Given population growth projections, by 2020 the amount of dollars leaving the County for fossil vehicle fuel will rise by almost 30 percent—more if fuel cost increases are added.

Napa County's transportation and land use patterns function as an integrated countywide system—no actions in a single jurisdiction can adequately address the target reduction. Thus effective transportation actions will require both cooperative action among all Napa jurisdictions and strategic planning in cooperation with our neighboring counties.

Broadly, there are three main ways to reduce GHG emissions from the transportation sector:

1. Implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation, such as public transit, car and van pooling, cycling, and walking.
2. Use vehicles that release fewer greenhouse gases, such as hybrids, more fuel-efficient vehicles and vehicles that run on alternative fuels.
3. Encourage 'smart growth' policies that promote efficient land use development. Smart growth reduces the need to travel long distances, facilitates transit and other non-automotive travel, increases the availability of affordable housing, employs existing infrastructure capacity, promotes social equity, helps protect natural assets, and maintains and reinforces existing communities.

Achieving even a 15 percent GHG reduction by 2020 in the Bay Area's transportation sector will be very difficult, according to transportation modeling and forecasts from regional agencies. Initial results of the modeling done for strategies in the Draft NCTPA Strategic Transportation Plan echo these findings. Napa County scenarios, which include bold and dramatic land use policy changes, do not quickly produce significant GHG reductions. The reasons appear to be that local land use changes don't significantly alter traffic patterns originating from Solano and Sonoma Counties and that much of Napa County's infrastructure is unalterable, at least in the short term.

Transportation and land use patterns are tightly linked. Building new roads can lead to sprawl, which leads to more development farther away from urban centers. Through transit-oriented development policies, new or intensified development can be channeled to urban centers. As urban centers become more densely populated, transit, walking and biking become more attractive and can successfully displace auto travel. Conversely, lower, more

²²Metropolitan Transportation Commission: Travel Forecasts Data Summary, Transportation 2035 Plan for the San Francisco Bay Area, December 2008.

²³Based on 60 million gallons total fuel sales, at an average of \$2.50 per gallon (Caltrans).

spread-out population density leads to an overall per capita increase in personal automobile use. A recent study showed that the further residents live from city centers, the more driving they do. In contrast, other cities have demonstrated that aggressive and early management of land use and transportation can lead to success in reducing a community's GHG emissions due to personal auto use.

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“Napa’s Transportation Future” Strategic Plan

“Napa’s Transportation Future,” a countywide strategic transportation plan adopted by the Napa County Transportation and Planning Agency, outlines a compelling vision and set of goals, principles and challenges that are directly aligned with the goal of reducing transportation emissions. Directly relevant goals and objectives (to be met by 2035) include:

Goal: Reduce/restrain growth of automobile vehicle miles traveled (VMT)

Objective: 0 percent net growth in aggregate VMT

Goal: Shift travel from Single-Occupancy Vehicles to other modes

Objective: Increase the percent of county trips made by transit to 5%

Objective: Increase the percent of county trips made by bicycle to 10%

Objective: increase the percent of county trips made by walking to 10%

Goal: Reduce overall energy use and greenhouse gas (GHG) emissions

Objective: Reduce GHG emissions from all transportation modes in Napa County to 40% below 1990 levels

For the purpose of measuring GHG emissions reductions, these goals and objectives were modeled based on whether they reduced the overall demand for fossil fuel or encouraged the switch to renewable energy powered vehicles.

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The chart below shows the anticipated reduction from these actions. A 3.3% reduction in total transportation sector emissions can be achieved by increasing the number of trips using transit, walking or biking. A 2.1% reduction can be achieved from actions that slow down the growth rate of new VMT, such as land use policies that focus new growth in urban centers or near convenient transit and housing policies that result in affordable housing built near major employment centers or transit. Taken together, these measures result in a 5.3% reduction in emissions from the business as usual (65,000 tons/year below BAU). This overall reduction in transportation emissions equals 15% of the target reduction goal.



*BAU = Business as Usual; TBW= Transit, Walk, Bike

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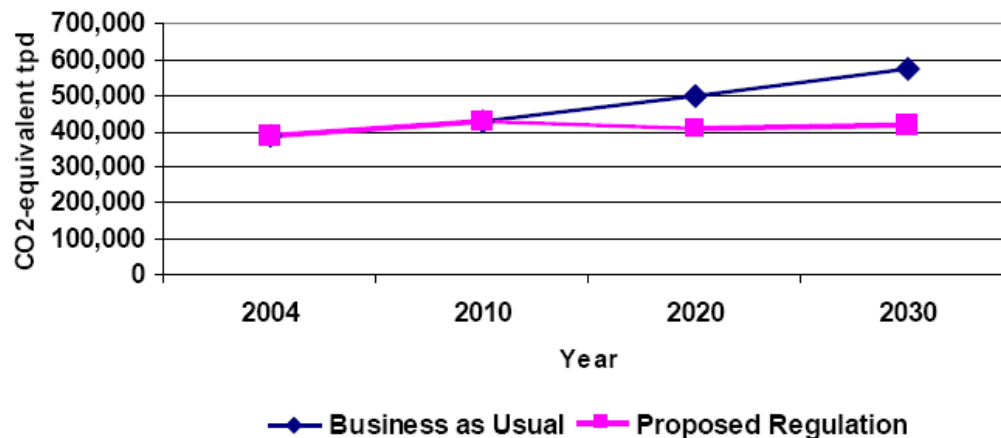
In June 2009, the US EPA granted a waiver to California to enable implementation of Assembly Bill 1493 (called the California Clean Cars Law or the Pavley Bill, passed in 2002). This law requires that, beginning with the 2009 model year, non-commercial vehicles sold in the state of California must reduce tailpipe emissions of greenhouse gases by 30% over an eight year phase-in period. Implementing this law will result in an estimated 18% reduction in total “business as usual emissions” from the California light duty fleet by 2020, and a 30 percent reduction by 2030. The effect of this law on vehicle emissions from the overall fleet is shown in the chart below.²⁴ Due to growth in the fleet, this regulation will serve to keep growth in total emissions from the fleet relatively flat. However, absent new regulation or other changes, emissions will start to rise again starting in about 2025.

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²⁴ Chart from California Clean Cars Campaign Fact Sheet.

The Result: Lower Global Warming Emissions

California's regulation results in a 18 percent overall reduction in total emissions (in tons) from the light-duty fleet in 2020 and a 27 percent overall reduction in 2030, relative to business as usual. While the regulations will slow the growth in global warming emissions, the expected growth in the number of vehicles on the road and the corresponding increase in miles traveled mean that further action will be needed to control emissions from passenger vehicles.



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OBJECTIVE TM1: Reduce demand for fossil fuel by decreasing vehicle miles traveled.

The actions described below will reduce vehicle miles traveled by:

- Slowing down the anticipated growth rate of new vehicle miles traveled;
- Increasing the number of people using transit, walking or biking;
- Reducing the average length of trips and increasing the efficiency of transportation system; and
- Reducing the total number of trips.

Slowing down the anticipated growth rate of new vehicle miles traveled

Land use policies reduce the growth in new vehicle miles traveled and have many community and quality of life benefits. The emissions reduction resulting from these policies is difficult to measure; however, in August 2009, the Transportation Review Board published a study that shows how "more compact, mixed-use development can produce reductions in energy consumption and CO2 emissions both directly and indirectly."²⁶ Based on the findings in this report, it is estimated that these countywide land use actions can result in upwards of a 15 percent reduction in the growth rate of vehicle miles traveled.

²⁵ From fact sheet published by California Clean Cars Campaign (calcleancars.org).

²⁶ Transportation Review Board: "Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use, and CO2 Emissions."

By 2020, the goal is to increase the number of trips that use transit from 1.5% to 2.9%, those that use bicycles from 2.2% to 5.3%, and those that entail walking from 5.8% to 7.5%. Overall, this goal means over 15% of all of the trips in Napa County will use public transit, bicycles or walking.

ACTION TM1.1: Enhance our commitment to urban-centered growth, adopting policies, zoning, and design standards in each jurisdiction to encourage mixed-use, live/work, and “walkable” and “bikeable” neighborhoods.

Unincorporated Napa County

- Adopt and implement standards and design guidelines to ensure that the proposed Napa Pipe Project develops as a new “walkable” neighborhood, if the decision is made to redevelop this brownfield site to accommodate new uses.
- Ensure that pedestrian and bicycle improvements are included as a condition of any planned development project.
- Collaborate with the City of St. Helena on design standards for South St. Helena such that future projects in the area can encourage rather than discourage pedestrian activity, and that appropriate pedestrian and bicycle improvements are included as conditions via the County’s use permit process.

City of Yountville

- Use stimulus funding for construction of Yountville section of countywide bike trail.
- Build elements of the Bicycle and Pedestrian Pathways Plan adopted in July 2003.

American Canyon

- Adopted Reaction 2008-24 in February 2008, which supports:
 - Adopt land use policies that reduce sprawl, preserve open space, and create compact, walkable communities.
 - Take actions in the City’s own operations and in the community to be energy and resource efficient.
 - Promote transportation options such as bicycle and pedestrian trails, commute trip reduction programs and incentives for carpooling and transit.
 - Help to educate the public, business and industry about energy and resource conservation.

City of Calistoga

- Install more bike racks throughout the community.
- Implement the City of Calistoga Bicycle Transportation Plan, including construction of specific routes, lanes, paths and river crossings recommended in the plan.
- Support current (or stronger) language in the Housing Element Update that calls for denser, more compact development and increased emphasis on developing infrastructure for nonmotorized transportation.

City of Napa

- Maintain growth focused urban limit line for development.

- Promote creative and efficient use of vacant lots and built-on land.
- Promote walking and bicycles by encouraging development near services.
- Implement policy requiring minimum density in mixed use categories.
- Encourage residential and mixed use development near services and transit.

City of St. Helena

- Develop community public parks and open spaces to compliment higher density development.
- Support higher density urban infill development.
- Increase walkability in downtown area for one-stop shopping.

ACTION TM1.2: Maintain or improve the County’s overall “balance” of 70,690 jobs and 64,100 employed residents (ratio of 1 to 1) through land use policies and decisions that locate jobs and wage-appropriate housing in proximity to each other.

Unincorporated Napa County

- Quantify employment growth as part of environmental reviews and direct employment-intensive uses to sites that are located near housing.
- Require housing impact fees be paid by non-residential projects and deposited in an Affordable Housing Fund which shall be made available to facilitate the construction of new affordable housing in the cities and the county.

City of Yountville

- Exercise an Inclusionary Housing Ordinance requiring an in-lieu fee for or construction of affordable housing to balance jobs/housing mix.

City of Calistoga

- Consider incentives for hiring locals.

City of St. Helena

- Support jobs-housing balance to reduce dependency on commuters.

ACTION TM1.3: Require discretionary development projects to assess and mitigate the impacts of vehicle miles traveled through transportation demand management programs including providing transit amenities.

Unincorporated Napa County

- Request that use permit applicants develop and implement a transportation demand management (TDM) program aimed at reducing vehicle miles travelled and shifting automobile trips outside the peak hours when traffic congestion is at its worst.

City of Calistoga

- Evaluate GHG produced as a result of any proposed project and mitigate pursuant to CEQA.

ACTION TM1.4: Evaluate truck and freight rail routes and, based on these findings, develop policies and strategies that improve circulation and address neighborhood compatibility issues.

ACTION TM1.5: Adopt and implement the NCTPA Strategic Transportation Plan to increase transit service and ridership throughout Napa County.

City of Yountville

- Yountville Shuttle provides free rides throughout town and to Lincoln Theatre.

American Canyon

- See TM1.1.

Increasing the number of people using transit, walking or biking

“Napa’s Transportation Future” places strong emphasis on providing alternative choices to single occupancy vehicles. Specifically, this Plan calls for significantly increasing the percentage of trips that use transit or bicycles or walk.

ACTION TM1.6: Complete a multi-use countywide Class 1 trail from Calistoga to American Canyon (also known as the Napa Valley Vine Trail), and adopt and implement pedestrian and bicycle networks within each city and town that connect to it.

Unincorporated Napa County

- Unincorporated Napa County will play a crucial role in creating and owning the “Vine Trail” as it passes through protected agricultural land.
- The County has also committed to designate 40 miles of bike lanes by 2030 (General Plan Objective CIR-3).

American Canyon

- See TM1.1.
- The General Plan includes policies to plan and create a comprehensive bicycle and pedestrian system, and supports linking to the Bay Area Ridge Trail and Bay Trail. The Parks and Recreation Department is working with the Public Works Department to plan a citywide bicycle and pedestrian path framework, and to implement several specific trails, including segments of the Bay Trail and Ridge Trail networks.

City of St. Helena

- Investigate use of railroad for freight delivery.

ACTION TM1.7: Maintain and enhance existing express bus, local bus, and paratransit services, establish a northbound upvalley express bus during peak commute hours, and complete construction of a major transit center in central Napa.

American Canyon

- See TM1.1.

- Finalize a Citywide Circulation Study and General Plan Circulation Element update that will complement the NCTPA Strategic Transportation Plan.

City of Calistoga

- Make schedules available, keep bus stops clean, attractive and well lit, preferably with solar lights. Make all-day parking available and convenient for bus riders.

ACTION TM1.8: Expand Park and Ride areas and other support facilities to encourage public transportation use and car and van pooling.

American Canyon

- See TM1.1.

City of Calistoga

- Develop a Park-n-Ride Facility.

County of Napa

- Require multifamily housing projects to designate areas for resident-commuters to park and ride to employment centers like downtown Napa.
- Require projects along transit corridors to provide for transit access improvements.

City of St. Helena

- Establish a northbound upvalley express bus during peak commute hours.
- Encourage employers to offer incentives for carpooling, including use of electric or hybrid vehicles.

ACTION TM1.9: Study rail and bus rapid transit options in the Highway 29 corridor between Vallejo and downtown Napa, and in the Highway 12 corridor between Fairfield and central Napa. Plan for the phased implementation of transit improvements with the goal of bus rapid transit between Vallejo ferry and the Fairfield and central Napa transit centers.

ACTION TM1.10: Implement programs that encourage car-free tourism such as zero emission shuttle services during peak weekends and special events.

City of Calistoga

- Establish a shuttle service in and around Calistoga in partnership with tourist-oriented businesses, including but not limited to resorts and wineries.

Improving the overall fuel efficiency of the transportation system

In general, the reductions in emissions from local measures that improve overall fuel efficiency are small compared to the expected reduction from increases in fuel efficiency resulting from increasing the fuel efficiency of cars and light trucks²⁷. However, these local

²⁷ The U.S. EPA recently granted California the authority to implement the California Clean Car Law or Pavley Law (AB 1493). Amendments to harmonize California and federal vehicle fuel efficiency standards are underway, <http://www.arb.ca.gov/cc/ccms/ccms.htm>.

measures are important, because they can be implemented relatively quickly and at a low cost, whereas the emissions reduction from increases to fuel efficiency standards is not under local control and takes up to 15 years to make a difference.

Overall, these local measures will result in an estimated 0.4% reduction in transportation sector emissions for each 1% improvement in fuel efficiency. An improvement of this sort might be achieved, for example, by a 1% reduction in time spent idling at stoplights.

ACTION TM1.11: Improve the fuel efficiency of the public street system by optimizing signal timing on arterials, improving street connections and reducing circuitous routes.

County of Napa

- Complete the Devlin Road extension and bridge over Fagan Creek before 2018.
- Facilitate Caltrans projects including Highway 29 Channelization, Jamieson Canyon, Airport Interchange and Soscol Flyover.
- Regularly monitor traffic signals and other intersection controls to ensure maximum efficiency.

Reducing the average length of trips

Each 1% of average trip length reduction will reduce transportation sector emissions by 0.1%. There are also several significant co-benefits from this action including additional local jobs, more robust local economy, and a healthier community.

ACTION TM1.12: To reduce vehicle miles, adopt policies and ordinance changes that facilitate working at home, and support local hiring, food production, farmers markets, and community-based "buy local" campaigns. (See also AN1 and AN4.)

Unincorporated Napa County

- Adopt an ordinance removing regulatory impediments that constrain local farmers from selling their produce locally.
- Adopt an environmentally preferable procurement policy that includes guidelines related to local hiring/procurement. (Also see strategies SW6, AN4, and LG7.)

Reducing the total number of trips

One method of reducing the total number of trips taken by single occupant vehicles is to adopt transportation demand pricing policies. These policies help ensure that private vehicle use pays its fair share by reflecting the true cost of automobile use to the community. For example, road use charges (various direct charges applied to those using roads, including fuel taxes, license fees, parking taxes, tolls, and congestion charges, which may vary by time of day, by the specific road, or by the specific vehicle type, being used) and parking fees (requiring users of parking to pay the costs directly, as opposed to sharing the costs indirectly with others through increased rents and tax subsidies) reflect a full-cost pricing approach. Other methods of trip reduction include increasing telecommuting.

ACTION TM1.13: Develop parking strategies in downtown areas to help reduce vehicle miles traveled.

Unincorporated Napa County

- Require developments to include adequate parking to meet their anticipated parking demand, but do not provide excess parking that could stimulate unnecessary vehicle trips.
- Ensure that shared parking is considered where feasible.
- Provide parking areas for carpools, vanpools, and bicycles where appropriate.

City of Calistoga

- Revise the Off-Street Parking and Loading Ordinance to address parking requirements, parking design and parking exceptions.

City of Napa

- Lower parking standards in downtown area.

ACTION TM1.14: Implement transportation demand reduction (TDM).²⁸

Unincorporated Napa County

- Request that use permit applicants develop and implement a TDM program aimed at reducing vehicle miles travelled and shifting automobile trips outside the peak hours when traffic congestion is at its worst.

City of Calistoga

- Evaluate GHGs produced as a result of any proposed project and mitigate pursuant to CEQA.

Objective 2: Encourage and support the switch from fossil-fuel powered vehicles to renewable energy powered vehicles.

The American transportation system is highly automobile-centric. Our communities are built around the use of the automobile for personal transportation. It will be a long time before the beneficial effects of building new walkable, car-less communities are fully realized. As attractive as the vision of a car-less society may be from the viewpoint of GHG emissions reduction, it is a remote vision. Thus, the personal vehicle is almost inextricably enmeshed in the American lifestyle for the next several decades.

Potential policies and programs that help businesses and organizations with fossil-fuel powered fleet vehicles switch to vehicles powered by clean, renewable energy sources include:

- Deploy electric vehicle fleet using infrastructure developed in cooperation between the local energy authority and a private EV fleet operator.
- Implement vehicle-to-grid communications and control systems that are designed to exchange data with the electric grid, to help recharge the onboard battery pack without strain on the electric grid, and potentially to serve as an energy storage system for the

²⁸ TDM Encyclopedia. Victoria Transportation Policy Institute. www.vtpi.org.

electric grid. The system will reflect the battery storage requirements of the renewable portfolio.

- Encourage a large enough number of vehicle replacements countywide to reduce fossil-powered automobile trips by an additional 10 percent.

Given that the scientific imperative to significantly reduce GHG emissions has some urgency, American communities must also explore planning to expedite the deployment of non-fossil fuel powered vehicles. The drawbacks to these alternatives, primarily electric vehicles, are both cost and practicality. Therefore, this Climate Action Plan has identified several potential avenues for dramatically decreasing the cost and increasing the practicality of electric vehicles.

Electric vehicles substitute stored electricity for fossil fuel to provide motive power. However, electricity can also give rise to GHG emissions, depending on how it is generated. The majority of the cost of electric vehicles lies in the batteries. It is possible for local governments to include vehicle batteries and charging stations as part of a public power portfolio, since vehicle batteries can be used to augment the grid energy storage capacity required for renewables.

ACTION TM2.1: Adopt consistent policies and programs that help businesses and organizations with fossil-fuel powered fleet vehicles switch to vehicles powered by clean, renewable energy sources. (See also LG1.)

City of Calistoga

- Support the installation and/or development of a compressed natural gas filling station.

Emissions Reduction Summary – Increase Transportation and Mobility Options

Objectives	Implementer	Feasibility	Potential Tons GHG Reduced	Estimated Investment
Objective TM1 Reduce demand for fossil fuel by decreasing vehicle miles traveled				
Slowing down the anticipated growth rate of new vehicle miles traveled (<i>Actions TM1.1, TM1.2, TM1.3, TM1.4, TM1.5</i>)	All Jurisdictions, NCTPA	Moderate	25,000 or 6% of total target reduction	Nominal – these are mostly planning actions and regulatory changes

Objectives	Implementer	Feasibility	Potential Tons GHG Reduced	Estimated Investment
Increasing the number of people using transit, walking or biking (Actions TM1.5, TM1.6, TM1.7, TM1.8, TM1.9, TM1.10)	All Jurisdictions, NCTPA	Challenging	40,000 or 9% of total target reductions	Expand Bus service: \$10M VineTrail: \$32-48M Park and Ride Lots: \$3M Tourist Shuttles: unknown
Improving the overall fuel efficiency of the transportation system (Action TM1.11)	All Jurisdictions, NCTPA, EPA and CARB	Easy (reductions due mostly to CA Clean Car Law)	80,000 or 18% of target reduction	Improved traffic signalization and flow: \$1M
Reduce length of trips (Action TM 1.12)	All Jurisdictions, NCTPA	Moderate	Difficult to quantify	Nominal – these are predominantly planning actions and regulatory changes
Reduce # of trips (actions TM 1.13, TM 1.14)	All Jurisdictions, NCTPA	Moderate	Difficult to quantify	Nominal – these are predominantly planning actions and regulatory changes
Objective TM2 Encourage and support the switch from fossil-fuel powered vehicles to renewable energy powered vehicles.				
ACTION TM2.1: Adopt consistent policies and programs that help businesses and organizations with fossil-fuel powered fleet vehicles switch to vehicles powered by clean, renewable energy sources. (See also LG1.)	All Jurisdictions, NCTPA	Moderate	To be determined	Nominal – these are predominantly planning actions and regulatory changes

DRAFT

Goal 2. Improve Buildings and Energy Efficiencies (BE)

Buildings

This section addresses electricity and natural gas usage in Napa County and looks at the impacts of efficiency, existing buildings, new construction, water and wastewater on electricity and natural gas usage.

Given Napa County's overall 2020 reduction target of 31 percent, it will be necessary to reduce GHG emissions in the built environment by upwards of 60 percent.

Energy efficiency improvement, especially in building shells, consistently shows itself to be the most cost-effective means of reducing emissions. However, the typical GHG reductions resulting from efficiency improvements are still small relative to their potential and the AB 32 target. The primary reason for this is that historically, homeowners and businesses have been slow to invest in energy efficiency measures. Nonetheless, there is reason to believe that proper program design—including subsidized pricing and “opt-out” rather than “opt-in” strategies—might help overcome some of these limitations and would represent upwards of 10% of the total emissions reduction needed.

Although renewable energy supply actions, in particular, individual actions such as rooftop solar PV, are often heralded as being the answer for GHG reduction, the recommended approach comprises a complete “low carbon” portfolio for grid electricity supply. While this sounds and is ambitious, it is the best way to achieve the lowest possible cost of electricity while reducing the carbon footprint of the electricity supply. This approach is technology “agnostic,” not favoring a particular type of generation. Instead it is based on the local availability of renewable resources closely matched to local demand. In addition, this approach treats efficiency measures and demand reduction techniques as creating “virtual capacity” that lowers the cost of implementing renewable energy actions. Given the capital intensive nature of renewable energy, financing becomes the major factor that determines the cost of renewable energy. Thus, financial instruments and scenarios are included as part of the renewable energy portfolio design.

Reducing the carbon emissions from building energy use requires two changes:

1. Improve energy efficiency to reduce energy consumed.
2. Reduce the carbon intensity of energy supplies, primarily by increasing renewable sources of electricity such as solar and geothermal power.

Analyses explained in the following pages illustrate that switching to renewable energy sources for buildings is a key tool to achieve overall countywide emissions reductions.

Buildings are the single largest contributor to carbon emissions in all of the towns and cities of Napa County, except for the City of Napa. Overall, buildings in Napa County account for 36% of all of the carbon equivalent emissions in Napa County (423,011 of the 1,200,281 metric tons of CO₂ equivalent emissions).

GHG Emissions

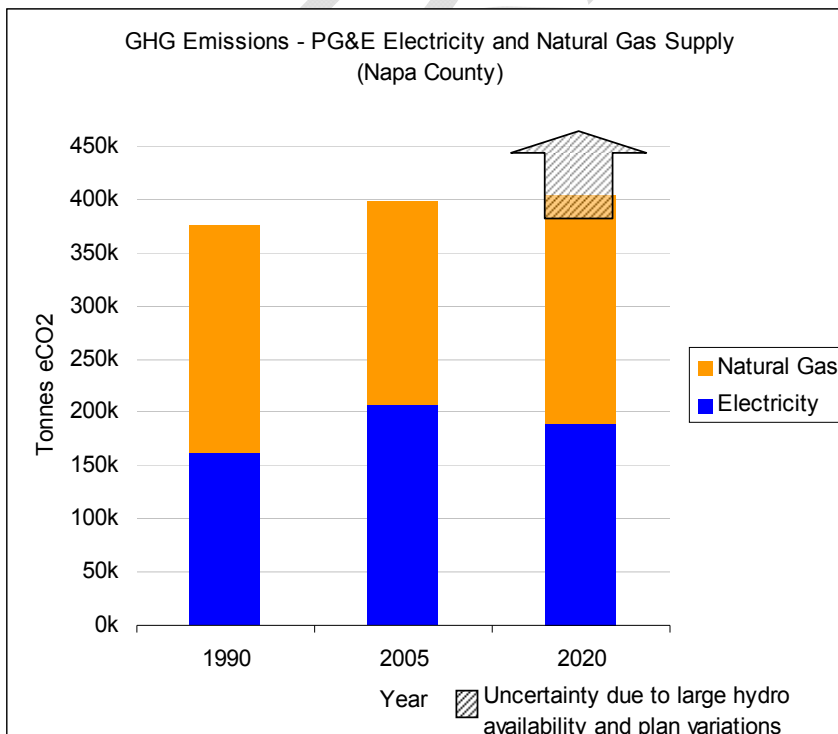
	Residential Buildings	Commercial Buildings	All Buildings	% of Total County
American Canyon	19,819	21,672	41,491	10%
Calistoga	7,758	7,062	14,820	4%
City of Napa	106,003	71,120	177,123	42%
St Helena	10,781	17,458	28,239	7%
Yountville	3,765	14,032	17,797	4%
Unincorporated	48,224	95,317	143,541	34%
Total Napa County	196,350	226,661	423,011	

Because buildings last for many decades, efforts to reduce emissions from buildings need to address both existing structures and new construction. Given that the vast majority of the building stock that will exist in 2020 already exists today, the primary actions to reduce carbon emissions from building energy use are those that improve the energy efficiency of existing buildings.

Energy Efficiency and Water

The water and wastewater systems are the largest single users of electricity in Napa County. Based on results obtained in Sonoma County, efficiency improvements in water system pumping and wastewater operations can be cost-effective. However, municipal operations in total account for 2 percent or less of total emissions from the County.

Findings reveal that Napa County’s GHG from electricity from PG&E are projected to decrease while emissions from natural gas will actually increase.



Propane

Although not included in the community-wide GHG inventory, propane use in the county may constitute a significant emissions source.²⁹ The majority of emissions occur due to the same end uses as natural gas in the residential and commercial sectors. Thus the measures described above for emissions reduction in the natural gas sector can be applied to emissions due to propane use. It is presently unknown whether propane will be considered in future GHG emissions inventory standards.

Objective BE1: Reduce energy demand through conservation and efficiency.

The actions described below will reduce the use of electricity and natural gas in existing and new buildings by:

- Improving the efficiency of existing buildings
- Reducing the anticipated growth of energy use in new buildings

Improving the efficiency of existing buildings

Improving efficiency rightfully receives much attention because it is the most cost-effective approach for reducing GHG emissions. Reduction in energy demand has the same effect on total GHG reduction as replacing GHG-emitting energy sources with non-emitting sources. Thus, an efficiency retrofit of existing buildings that lowers energy consumption can have the same benefit as building windmills or installing solar panels.

Despite California's national leadership in energy-efficiency, there is a considerable gap between current per capita energy consumption and what is technically or economically feasible.

Through the energy efficiency study conducted for this Plan, it was confirmed that the current energy efficiency upgrade delivery programs in California fall far short of achieving all the potential efficiency improvements.³⁰ Methods for overcoming economic barriers to adoption of efficiency measures include energy-efficiency policies that are based on a sound understanding of the market problems they seek to correct and a realistic assessment of their likely effectiveness.

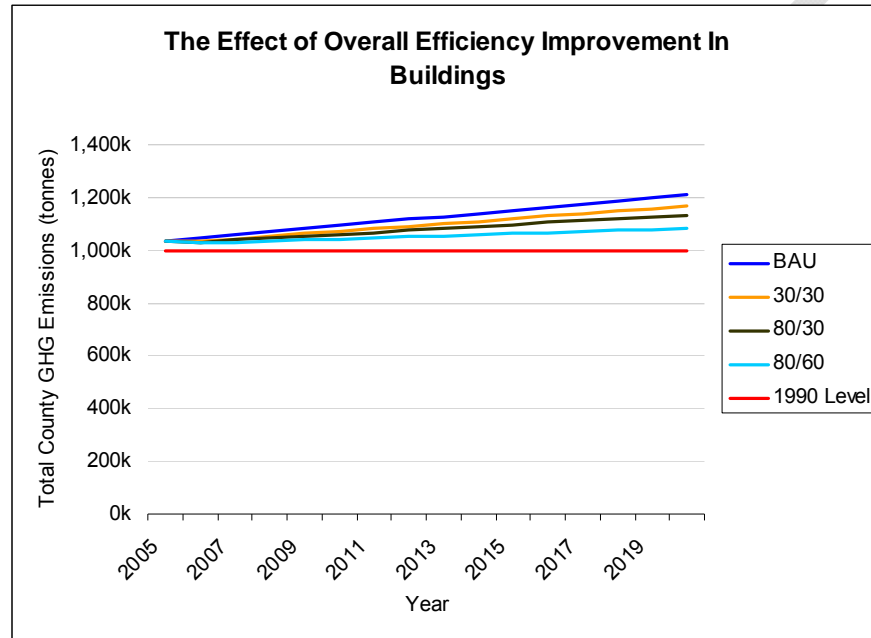
To be on track to reach the 2020 emissions target, and assuming that building energy savings will comprise 67 percent of the projected reductions, extensive building energy efficiency measures must be taken. Furthermore, since a large majority of the building energy use in the year 2020 will be from existing buildings, extensive energy-saving retrofit measures are necessary.

²⁹ Data on propane use in Napa County was obtained from the Western Propane Gas Association.

³⁰ Analysis can be found at "High Performance Efficiency" online link under Technical Source Material at <http://coolplan.org/ccap-report/source-material/source-material-toc.php>

The effect of the various levels of efficiency improvement for both natural gas and electricity end uses in the residential and commercial sectors are shown below. There are two observations regarding the effect of efficiency that can be made:

- Efficiency creates the greatest reduction at the lowest cost, if implemented at the highest possible level.
- By itself, efficiency improvements in existing buildings, even at very high levels compared to historical performance of utility-run programs, is *not sufficient* to return emissions to 1990 levels.



30/30 = 30% of residential households performing retrofits with average of 30% efficiency improvement; 80/30 = 80% of residential households performing retrofits with average of 30% efficiency improvement; 80/60 = 80% of residential households performing retrofits with average of 60% efficiency improvement .

<show data table and redo graph for admin draft>

Efficiency retrofits are cost-effective when the annual energy savings is greater than or equal to the annual payment on the financed amount. For the residential sector, cost effectiveness was assessed using a seven percent interest rate, financed over 20 years. Total program cost assumes 80 percent uptake rate (this means 40,000 of the 50,000 total Napa households perform energy efficiency retrofits). Using these financing terms, the annual payment per household for these efficiency measures is likely to be less than or equal to the savings from lower energy bills.³¹

³¹ For the full cost and uptake analysis for a Napa County energy efficiency program, such as an AB 811 type program, see Appendix E: Implementing an AB 811 Program in Napa County.

<Sidebar>

Electricity Efficiency Retrofit

For residential customers, the most effective electricity efficiency upgrades include:

- Refrigerators
- Air conditioning (central and room)
- Space heating
- Water heating
- Lighting
- Clothes dryers
- Freezers
- Dishwashers

Natural Gas Efficiency Retrofits

Highly effective efficiency upgrades include:

- Additional attic insulation
- Building leakage testing and sealing
- Duct sealing
- Programmable thermostat
- High efficiency (95%) furnace

Note: Permanently installed items qualify for AB 811 financing (see Appendix E). For the above list, central air conditioning, electric furnaces or baseboard heat, electric water heaters and any permanently installed lighting would qualify.

<end sidebar>

The Napa countywide actions that will reduce electricity and natural gas use in existing buildings include:

ACTION BE1.1: Implement an AB 811 program, making funding available to residential and commercial property owners seeking to improve their properties to conserve energy and water, and to generate renewable energy.

Unincorporated Napa County

- Play a crucial role in instituting and implementing this program by coordinating with regional- or State-wide partners and processing agreements and assessments. Program guidelines should include pre- and post-project audits to measure energy savings.

City of Calistoga

- Establish a weatherization program and performance improvement program for existing residential units in partnership with utility companies and other organizations.
- Adopt a Dark Sky Ordinance.

ACTION BE1.2: Pursue State and Federal funding programs designed to reduce energy demand through conservation and efficiency.

American Canyon

- Hire a grant writer to research available grants and help to compile them. The Public Works Department is applying for an Energy Efficiency and Conservation Block Grant to convert the City's streetlights to LED.

ACTION BE1.3: Require or request discretionary development projects to assess greenhouse gas emissions due to energy use, and to incorporate energy and water conservation measures into projects

Unincorporated Napa County

- Quantify GHG emissions anticipated from all discretionary projects consistent with General Plan Policy CON-65, except in the case of projects which qualify as categorically exempt pursuant to the local procedures for implementing CEQA.
- Collect data on GHG emission reduction strategies that are being implemented voluntarily by project applicants, and use this data to develop new requirements or incentives (if necessary) to ensure that all discretionary projects are implementing best practices to reduce GHG emissions by January 2011.

City of Yountville

- Reclaim water from the Wastewater Treatment Plan and deliver to three wineries and the golf course for irrigation.

American Canyon

- See BE1.2.
- Require that projects address, and inform the City about, actions that applicants are taking or will take to reduce emissions from transportation and site and building water and energy use. Require projects to assess their emissions due to transportation and energy use, and to incorporate conservation and emissions-reduction measures into their projects. Where impacts may still be considered cumulatively significant, mitigation measures consistent with the California Attorney

General's settlement requirements and/or additional measures agreed to by the applicant are added.

Reducing the Growth of Electricity and Natural Gas Use

Every new building, no matter how energy efficient it is, will still add to emissions if it uses natural gas or grid electricity or if it increases fossil fuel-powered transportation. Clearly, a means to mitigate all new construction in Napa County so that it is at least “carbon neutral” must be developed. Installing energy generation—solar, wind, or other renewable source of power—as part of the building is one way to zero out the GHG emissions from the building. Another is offsetting energy consumption attributable to the building by reducing GHG emissions elsewhere.

The promotion of energy efficiency programs, as well, can contribute to reductions in building electricity and natural gas use. Utilities and other program implementers promote brands and incentive programs to consumers to encourage them to buy efficient appliances like Energy Star or upgrade the efficiency of their buildings and homes. Tax rebates help offset the cost of solar systems for property owners. The effectiveness of energy, water, and wastewater efficiency programs is limited by the number of customers that “opt-in” or “buy” the program. It is left to the customer to make a decision, arrange the financing, and have the work done.

The rate of penetration of such programs depends largely on the effectiveness of their marketing. Even though the program may make financial sense, the number of customers who actually implement efficiency measures has been relatively small compared with the level required to meet GHG emission reduction goals.

Green Building Ordinances

The following strategies could reduce the growth rate of emissions below the forecast business as usual growth rate:

- Institute a mandatory green building ordinance throughout Napa County that covers all new residential and commercial construction, all commercial tenant improvements, and residential additions greater than a certain square footage (Rohnert Park provides a green building ordinance example)³²
- Remove barriers to green building
- Require zero-energy “inclusionary” quotas for multiple building projects

For Napa County, the growth rate of electricity and natural gas can be reduced by enacting an ordinance that requires an additional 15 percent reduction below state-mandated Title 24 standards. This would result in an additional 1 percent reduction below business as usual emissions in 2020.

To the extent that water end use efficiency can be implemented, reductions in system flow can produce a greater reduction in energy use by water and wastewater systems than efficiency improvements. This is particularly true for increasing the efficiency of residential

³² City of Rohnert Park, Green Building Ordinance, July 2007.

hot water end use. There is a “multiplier effect” if less hot water is used due to the overall decrease in the amount of energy used to transport, heat and process the water.

ACTION BE1.4: Implement improved energy conservation (Title 24) standards for new buildings starting in January 2010, and before 2011 adopt enhanced green building ordinances that meet or exceed the 2010 California Green Building Standards.

Unincorporated Napa County

- Ensure that projects result in “high performance” buildings comparable to a minimum LEED rating of Silver or similar level on the Green Point Rated system. (General Plan Policy CON-67(d))

City of Yountville

- Construct the Yountville Community Center and Hall project, scheduled for completion in October 2009, to include green building techniques and geothermal and solar renewable energy.
- Develop and promote a green building ordinance.

City of Calistoga

- Adopt State Green Building Codes with local mandates and implement appropriate rating systems to facilitate incentives.

City of Napa

- Adopt green building ordinance requiring new commercial and municipal buildings over 30,000 square feet in size to build to a LEED Silver standard.
- Appoint a green building task force to make recommendations to staff for the development of a mandatory phase II green building ordinance that will include all new residential and commercial, including municipal, buildings not covered in the existing green building ordinance.

City of St. Helena

- Adopt Green Building Ordinance as supplement to existing codes.

ACTION BE1.5: Adopt policies and ordinance changes to reduce energy use by promoting domestic water conservation and requiring water efficient landscape improvements associated with new construction. (See also AN7 and AN8.)

Unincorporated Napa County

- Prioritize the MST water deficient area as part of water conservation programs.
- Adopt and implement a water efficient landscape ordinance that will be adopted in compliance with State law requiring review and certification of landscapes associated with all discretionary projects and residences.
- Enable the permission of grey water systems, encouraging the capture and reuse of recycled water for landscape irrigation in conformance with State regulations.

City of Yountville

- Institute rebate program for washing machine and toilet replacement.

- Implement Water Conservation standards in the Municipal Code.

City of Calistoga

- Encourage native, drought resistant plants in landscaping by providing Master Gardener handouts with permits. Provide information on energy efficient appliances with permits.
- Provide information on energy efficient appliances with building permits.

American Canyon

- See BE1.3.
- Institute policies and ordinances to implement reductions in water use by residential, commercial, and industrial users within the Water District boundaries. Discretionary applications require an assessment of water use by the project, as compared with the City’s short term and long term water supply, and projects are required to reduce water demand through multiple measures.
- Encourage the use of drought-tolerant and native plants in landscaping. Submittal requirements for landscape plans for discretionary applications direct applicants to use plants from the East Bay Municipal Utility District’s book entitled *Plants and Landscapes for Summer Dry Climates*, which features plants that are drought-tolerant and well-adapted to the region. Standard conditions of approval include the requirement for “smart” irrigation controllers that tie into local weather conditions.

City of Napa

- Implement water conservation measures imposed by water division.

City of St. Helena

- Implement higher than state mandated building standards in local building ordinances (including cool roof; prohibition of woodburning fireplaces in new construction; and requiring oversize homes to meet the energy efficiency of smaller homes).
- Revise Public Works standards to use green materials (i.e. flyash in concrete).

Objective BE2: Improve the energy supply by switching from fossil fuels to renewables.

The current level of supplied renewable energy in Napa County is 14 percent. California state law requires all the utilities to supply at least 20 percent of their electricity deliveries from renewable generation by 2010 and 33 percent by 2020.

The actions described below will improve the energy supply by:

- Switching from fossil fuels to renewables

Switching from Fossil Fuels to Renewables

Napa County must decrease its use of electricity that is generated by fossil fuels and decrease its use of natural gas—as quickly as possible. This can be accomplished if PG&E alters its energy portfolio or if Napa County decides to purchase green power independent of PG&E, as AB 117 enables it to do.

Napa County would develop its renewables using the following design criteria:

- As stated previously, treat demand reduction as a “virtual resource” in the electricity supply and develop it as part of the portfolio.
- Minimize transmission (and thereby minimize “line loss” inefficiency) by building new supply as close to load as possible.
- Use resources opportunistically by using what is available in the vicinity of the load based on surveys of conditions on the ground.
- Tune the portfolio of renewable resources so that the characteristics of each type of renewable generation match the load profile.
- Use the lowest cost financing available to make smaller scale projects cost-effective.

Napa County has two available options under California law to seek alternatives that can offer the ability to invest local dollars in more renewable energy and efficiency:

1. Form a Municipal Utility District. Formation of a Municipal Utility District (MUD) must be done by ballot. Once the district is formed, it must condemn the electricity distribution poles and wires so that they can be purchased via eminent domain. The MUD then must take over the maintenance and operation of the local distribution infrastructure. The MUD must also take over meter reading, billing and customer service. The MUD also takes over procurement of electricity and may finance, build and operate new generation resources. Currently MUDs serve about 25 percent of the total electric load in the state of California.

2. Form a Community Choice Aggregation. A Community Choice Aggregation (CCA) can be formed via ordinance by local government and no vote is required. Once a CCA is formed, it can put the electricity franchise out for competitive bid similar to a solid waste hauling franchise. A competitive bid offer provides opportunity for a greener and more stable electricity product than that offered by PG&E, at a competitive rate. If such a bid is received, the public is given multiple opportunities to opt-out of the aggregation and remain as customers of PG&E. If competitive bids are not received, the community is under no obligation to proceed with a CCA.

Natural gas use accounts for approximately 20 percent of emissions in Napa County. The natural gas is used primarily for space and water heating in the residential and commercial sectors. Renewable energy sources can be used to replace natural gas for space and water heating applications. Solar water heaters are a well known and well understood technology, widely used and relatively inexpensive. Heat pump technology can use either latent heat in the earth or in the air (ground source and air source heat pumps). Where it is available, geothermal heat can be used to replace natural gas directly for water heating or space heating.

ACTION BE2.1: Increase local renewable energy generation such that the County will always generate more than 15 watts of renewable energy per capita.

<Request rewording this action to “Decrease per capita energy consumption to 1990 levels and increase non-emitting generation capacity to 60% or greater.”>

City of Calistoga

- Investigate Community Choice Aggregation.
- Encourage and promote the use of geothermal energy and geoexchange technology.
- Investigate possible sources of renewable energy e.g., solar/wind power, biofuels, and geothermal power.

ACTION BE2.2: Adopt policies and ordinances to remove regulatory impediments and economic disincentives associated with the generation and use of energy from renewable sources such as wind, geothermal and solar energy.

Unincorporated Napa County

- Expedite review of building permits for solar energy installations (with concomitant reductions in permit costs), continuing to permit geothermal wells through a ministerial process, and adjusting the zoning ordinance to permit small wind turbines without a use permit.

City of Calistoga

- Encourage and/or facilitate one or more pilot projects for wind, geothermal and/or solar power generation in City facilities.

City of St. Helena

- Develop standards for placement of photovoltaic panels so that they can have ministerial approval (don't require Design Review).

Financing

Having a set of complementary, versatile tools and knowing when and how to use them optimizes performance. A set of financing tools applied where best suited can overcome barriers and maximize uptake of both demand reduction measures and the deployment of small scale renewable generation. This will enable maximum GHG emission reduction most quickly at the lowest cost.

Descriptions of the best and most applicable financial tools we found for the electricity/natural gas sector follow.

Community Choice Aggregation (CCA)

Community Choice Aggregation allows cities and counties to determine their own electric energy supply, under AB 117 (Migden—2001). A powerful feature of a CCA is its ability to access one of the least costly financing sources, municipal revenue bonds also called H-Bonds. A CCA can issue these bonds without voter approval. They are not General Obligation bonds, so they do not put the municipality's General Fund at risk. H-Bonds are repaid from the electricity rates set by the CCA and charged to its customers.

AB 811 (Financing Initiative for Renewable and Solar Technology)³³

AB 811 became California law in September 2008. This legislation modified the California Streets and Highways code to allow local government to establish voluntary assessment districts. Under AB 811, local governments can loan money to property tax payers (residential and commercial) who opt-in to install on their buildings permanent energy efficiency improvements, as well as small scale electric generation, energy efficiency and retrofits, and solar hot water systems. The legislative body of any city, as well, is authorized to designate an area within which authorized city officials and willing property owners may enter into contractual assessments and make arrangements to finance public improvements to specified lots or parcels.

Several municipalities throughout the state have approved and implemented AB 811. Residents and businesses in these municipalities are able to finance the installation of energy efficiency improvements and distributed generation, renewable energy sources that are permanently fixed to real property within jurisdictions with low interest loans, which can be repaid in up to 20 years on property taxes. These municipalities include Palm Desert, San Diego, Los Angeles County, Sonoma County and Marin County, among others.

This action is ideal for financing building envelope retrofits.

Tariffed (utility-based) On-Bill Efficiency Purchase (PAYS)

This financing mechanism can be used by any utility. Customers pay for efficient appliances by agreeing to make monthly payments on their utility bill. Energy savings from purchased appliances exceed finance cost. Customers have no up-front payment, no debt obligation, no credit checks and no liens.

There are several examples of tariff systems throughout the country including New Hampshire, Michigan, New York and Hawaii, as well as PacifiCorp and Midwest Energy utility companies. In most cases, PAYS programs are operated by cooperative utility companies and investor-owned utilities. These financing systems can be paired with state public benefit funds. Regulatory policies that encourage utilities to develop and run energy efficiency programs can be vital to the success of on-bill financing programs. Third-party financing may be a viable alternative to on-bill financing systems provided through a utility. Possible methods of encouragement include performance-based financial rewards for running successful energy efficiency programs and profit restructuring mechanisms that address the throughput incentive.

³³ See Appendix E: Implementing an AB 811 Program in Napa County.

Emissions Reduction Summary – Improve Buildings and Energy and Energy Efficiencies

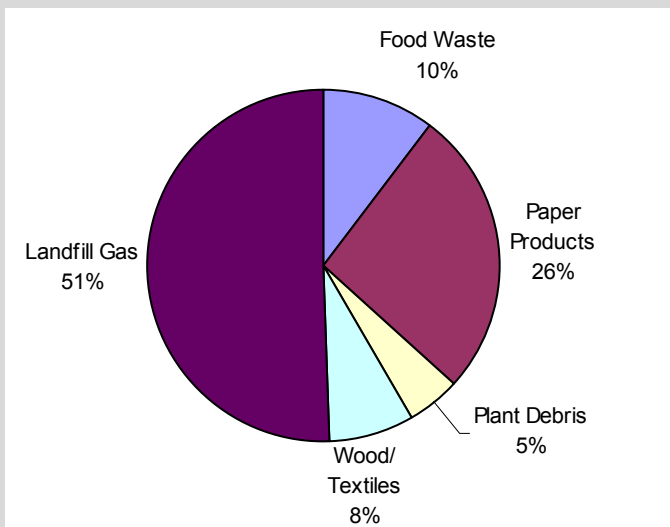
Objectives	Implementer	Feasibility	Potential Tons GHG Reduced	Estimated Investment
Objective BE1: Reduce energy demand through conservation and efficiency.				
Improving the efficiency of existing buildings (Actions BE1.1, BE 1.2, BE 1.3)	All Jurisdictions	Challenging	20,000 to 40,000 or 4% to 9% of target reduction	\$95 million (residential only)
Reducing the growth of electricity and natural gas use (Actions BE1.4, BE1.5)	All Jurisdictions	Moderate	45,000 to 75,000 or 10% to 17% of target reduction	\$133 million (residential only)
Objective BE2: Improve the energy supply by switching from fossil fuels to renewables.				
Switching from Fossil Fuels to Renewables (Action BE2.1, BE2.2)	All Jurisdictions	Challenging	190,000 or 43% of target reduction	\$890 million

Goal 3. Reduce Consumption and Solid Waste (SW)

Direct greenhouse gas emissions in the solid waste sector come primarily from anaerobically decomposing organic material in landfills (such as food scraps, yard debris, and paper) that produce methane and carbon dioxide. Significant quantities of indirect emissions are also connected to mining, manufacturing and transport of products and packaging. Substituting recycled materials for virgin materials in the manufacturing process reduces the GHG emissions, sometimes dramatically as in the case of aluminum, and less so with other materials, like glass.

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Community Waste Greenhouse Gas Emissions 2005



Landfill gas and paper products are the major waste sources of greenhouse gases in Napa County.

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GHG emissions from solid waste are reduced by removing organic waste from the wastestream prior to landfill by diverting organics to composting or other recycling efforts, and by managing emissions from landfills. At a minimum, burning landfill gas in a flare reduces GHG impacts from methane. Even better is using the landfill gas as a fuel for electric power generation. This energy source can increase the renewable fraction of the community energy supply and reduce the need for energy produced from fossil fuels.

Solid waste produced by Napa County in 2005 accounts for 54,209 tons of GHG emissions, equal to 4.7 percent of the County's total GHG emissions.³⁴

Napa County's solid waste is currently disposed at two locations, the Keller Canyon Landfill in Contra Costa County and the Clover Flat Landfill near Calistoga. The area served by the Clover Flat Landfill is essentially the same as the area of the Upper Valley Waste Management Agency, with about 20% of the county's waste buried there annually. The

³⁴ Napa County ICLEI 2005 Inventory

remaining 80% of Napa's waste is currently transferred from the Devlin Road Recycling & Transfer Facility to the Keller Canyon Landfill site. Both sites have landfill gas recovery systems that are estimated by the USEPA to be approximately 75% effective in recovering and controlling emissions of landfill gas.³⁵

In 2009 the Keller Canyon Landfill installed a landfill gas-to-energy plant to generate electricity and is therefore productively utilizing Napa County's and other North Bay communities' waste.

In contrast, the Clover Flat Landfill only flares the gas collected from the landfill. Based on industry experience and communication with Upper Valley Disposal & Recycling Company, owner of the Clover Flat Landfill, this facility is now generating enough landfill gas to enable installation of a landfill gas-to-energy plant that could produce about 750 kilowatts of electricity continuously or about 6,000 MW-hours of electricity annually.³⁶ This electricity is GHG-free; a similar amount of PG&E electricity would have generated about 1,500 tons of GHGs. With current PG&E Feed-In Tariff rates approaching \$100/MW-hour, and federal tax incentives, this action will generate GHG-free electricity with a positive net revenue flow after two years.

Implementing the Clover Flat Landfill project and implementing intensive efforts to divert organic material from landfills and increase recycling rates can produce a significant GHG reduction in Napa County's solid waste sector and contribute to the global GHG reduction imperative.

Methods to Reduce Waste

Modern solid waste management uses a hierarchy of approaches in order of greatest to least environmental and climate benefit:

- First—**REDUCE** the amount of waste created through efficient use of resources, more durable products, less packaging, buying less stuff, etc.
- Second—**REUSE** products and packaging as much as possible, i.e., thrift stores, coffee mugs instead of single-use cups, reusable produce crates/pallets, etc.
- Third—**RECYCLE** discards, including products, packaging, and organics (through composting).
- Finally, after doing all the above, landfill what's left, and then collect and use the landfill gas productively through energy production.

From a climate protection perspective, the ideal is to reach "zero waste" where nothing is landfilled and no fossil fuel is used to manage or transport waste. This is a concept equivalent to natural biological processes where the "wastes" from one organism are "food" for others, in a continuous cycle, or more accurately, an interconnected web.

Collecting, processing and burying municipal solid waste in landfills requires a significant amount of energy. Emissions from these activities are compounded by subsequent emissions of landfill gas. Although proper management of landfills can significantly reduce

³⁵ <http://www.epa.gov/lmop/faq-1.htm>

³⁶ Conversation between Ken Wells, consultant for CPC, and Bob Pestoni, owner, UVDS on Sept. 11, 2009.

the impact of these gas emissions, landfills still release some methane, a very potent greenhouse gas. An effective method for reducing landfill methane emissions is by reducing the organic fraction of the waste being buried. These organics can be composted to create soil amendments or used as a fuel for energy production.

Objective SW1: Achieve overall waste diversion of 75% to 90% by 2020.

The actions described below will achieve overall waste diversion by:

- Increasing overall diversion rates
- Reducing the amount of waste generated
- Reusing products and packaging
- Recycling or composting discards

Increasing Overall Diversion Rates

Diverting waste minimizes the land required for disposal sites for solid waste. Waste in landfills affects groundwater and soil; waste diversion from landfills supports clean and productive land. When waste is diverted, the environmental impact is reduced. Construction waste, demolition and organic wastes contribute a high volume of material to landfills. Recycling and composting such material can reduce the overall volume of waste added to landfills every day, while providing resources for other economic sectors. Reused construction waste and compost, for example, can act as a valuable commodity for construction companies, salvage yards and nurseries.

ACTION SW1.1: Enact ordinances and create incentives to increase construction and demolition debris waste diversion from 75% to 90% by 2020.

American Canyon

- Execute mitigation measures for discretionary projects that require recycling of construction and demolition debris, and the creation of a construction/demo debris recycling plan.

Unincorporated Napa County

- Execute construction and demolition provisions in garbage franchise agreements to achieve the highest possible diversion rate.

City of Napa

- Increase diversion rate by Napa Waste and Recycling.

City of St. Helena

- Encourage deconstruction (selective dismantling) of buildings rather than demolition.
- Require 50% waste diversion for all construction projects. 100% of excavated soil and land clearing debris shall be reused or recycled.

Additional Opportunities

Additional opportunities to increase overall diversion rates include:

- Enact mandatory recycling ordinances and provide financial incentives to increase residential, commercial, and construction and demolition debris recycling.
- Require multi-tenant commercial/residential building owners/managers to provide on-site access to recycling and composting containers/service.
- Create and support other collaborative and regional programs, such as the Napa County Green Business Program, environmentally preferable purchasing policies and joint-purchasing agreements among all local jurisdictions, to support the 75% or more overall waste diversion goal.
- Implement an intensive social marketing program to address barriers to recycling behaviors and promote resource conservation.

Reducing the amount of waste generated

Actions to reduce the amount of waste generated are primarily focused on shifting consumption behaviors to less GHG-intensive products. These regulatory tools, education efforts, and economic incentives are intended to create long-term changes in consumer behavior. Therefore, establishing short-term potential greenhouse gas reduction estimates is very speculative. The costs related to these actions are ongoing and primarily for staffing and various types of communications. The social marketing aspects of this action can be integrated into the recycling education efforts described above.

Of this set of actions, a carbon tax on products with significant associated emissions would have the greatest impact by directly reducing use of products and their associated life cycle GHG impacts; however, it is considered a very difficult political action at the local level.

Ordinances and incentives that could reduce waste generated include:

- Encourage the efficient use of resources through buying less stuff, more durable products, and less packaging.
- Reduce the volume of organics handled by the solid waste collection system through on-site agricultural, commercial and residential composting which reduces the emissions associated with moving this material from the generator to the compost facility or disposal site, as well as the emissions generated by production of synthetic fertilizers that can be offset by use of organic soil amendments.
- Support legislation and other efforts at local, state and federal levels that extends producer responsibility for managing their products and packaging at the end of their intended use.
- Encourage purchasing locally manufactured products.
- Provide financial preferences for purchasing locally produced items with recycled content.
- Educate residents and businesses on purchasing decisions. Identify and display the carbon emissions of products.
- Eliminate, through local ordinance, the use of non-recyclable takeout food containers.
- Enact a local carbon tax on products with significant associated emissions.

ACTION SW1.2: Enact ordinances and create incentives to achieve organic (food and green) waste diversion of 75% by 2020, including waste diversion from restaurants and special events.

City of St. Helena

- Encourage home composting of organic waste.

Reusing products and packaging

Reuse is a means to prevent solid waste from entering the landfill and to distribute discarded products to those who want them. In many cases, reusing products and packaging supports local community and social programs while providing donating businesses with tax benefits and reduced disposal fees.

Reuse requires fewer resources, less energy, and less labor, compared to recycling, disposal, or the manufacture of new products from virgin materials. Reuse strategies and programs provides an alternative to other waste management methods since it reduces air, water and land pollution, and limits the need for new natural resources.

ACTION SW1.3: Create and support other programs, such as the Napa County Green Business Program, that help achieve the 75% to 90% overall waste diversion goal.

ACTION SW1.4: Adopt environmentally preferable purchasing policies and explore joint-purchasing agreements with partner agencies, and local jurisdictions and businesses.

American Canyon

- See SW1.1.
- City purchasing decisions were modified last year, which included ending the purchase of Styrofoam cups, buying less toxic cleaning supplies, and purchasing all recycled content paper towels and toilet paper.

City of Calistoga

- Adopt programs to encourage a certain percentage of supplies purchased to be from recycled products.
- Eliminate, through local ordinance, the use of polystyrene food and beverage containers and plastic bags.
- Encourage or require reusable packaging.

Recycling or composting

Recycling and composting actions are primarily focused on removing organic wastes that have higher immediate greenhouse gas impacts than other waste types. Revenue to cover the costs for this action set can be collected in a number of different ways, most commonly through refuse collection rates and user fees, although franchise fees on waste haulers, landfill host fees and AB 939 fees can also be utilized. In order to divert 75% of the overall

Napa County wastestream, about 40% (70,000 tons) of the 177,000³⁷ tons of wastes still going to landfill need to be diverted.

By applying the California Integrated Waste Management Board's (CIWMB) 2003 California waste characterization data³⁸ to Napa's waste quantities, we can assume that 30% of Napa's waste going to landfill is organic. Of this compostable fraction, diverting two thirds of this from the landfill would represent about 35,000 tons per year or 100 tons per day of additional compost feedstock which can be composted or used as an energy source in an anaerobic digester. Applying the USEPA WARM tool to this type and quantity of organic waste results in a 3,700 ton per year reduction in greenhouse gas emissions (see calculation in Appendix I) from the solid waste sector attributable to Napa.

ACTION SW1.5: Establish collection services in all cities for segregated food waste from commercial sources and establish a local food composting facility.

City of Calistoga

- Implement programs to facilitate community waste reduction.

ACTION SW1.6: Encourage home composting of organic waste.

Unincorporated Napa County

- Provide free composting classes and distribute home composters.

City of Calistoga

- Adopt programs to encourage composting of kitchen waste.

Costs and Funding Opportunities

Funding and financing for the solid waste sector offer some special opportunities for local governments. User fees on waste generators to fund recycling education and other diversion efforts can be implemented by local jurisdictions—without going to a public vote—in a number of different ways, including collection rates, franchise fees on waste haulers, landfill host fees and AB 939 fees. Additionally, energy programs using solid waste and landfill gas are considered renewable energy sources, and are eligible for California and federal rebates, tax incentives and special financing.

Increasing Overall Diversion Rates

Increasing overall diversion rates is primarily focused on removing typical recyclables from the waste going to landfill. By recycling these materials and using them to replace virgin materials, significant GHG emissions are avoided. Although the reduced GHG emissions are substantial, much of the savings are indirect and accounted for in transportation and other savings. Costs for this action set can be collected in a number of different ways, including waste collection rates, franchise fees on waste haulers, landfill host fees and AB 939 fees. In order to divert 75% of the overall Napa County wastestream, about 40% (70,000 tons) of

³⁷ CIWMB 2005 Diversion/Disposal Rate Reports, see Appendix I.

³⁸ <http://www.ciwmb.ca.gov/Publications/LocalAsst/Extracts/34004005/Tables.pdf>

the 177,000³⁹ tons of wastes still going to landfill need to be diverted. By applying the CIWMB's 2003 California waste characterization study to Napa's waste quantities, we can assume that 40% of the wastestream is recyclable paper, metal, plastic and glass. Of this recyclable fraction diverting one-half (20% of the total waste stream) would represent about 35,000 tons per year or 100 tons per day of additional recyclables. Applying the USEPA WARM tool to this type and quantity of mixed recyclables results in a 90,000 ton per year reduction in Scope 3 greenhouse gas emissions (see report in Appendix I).

Reusing Products and Packaging

Reusing products and packaging requires staff time and communications, education and community outreach to maximize diversion opportunities.

The social marketing and community outreach aspects of this action should include other resource conservation behaviors. Educational cost estimates are based on spending \$5 per household per year above current recycling educational expenditures. With about 50,000 households in Napa County an annual outreach budget of \$5 per household is \$250,000. This funding level provides one to two contacts per household per year.

Regulations establishing economic incentives to reduce waste and encourage reusable packaging are more efficient when enacted at the state or federal level; however this action set can be used as a local action. If implemented locally, it should be considered a regional approach to avoid other unintended economic impacts, such as shifting consumer purchase patterns from one community to another. Due to the diffuse and indirect greenhouse gas impacts from this action, establishing a potential greenhouse gas reduction estimate is very speculative. The cost of the social marketing aspects of this action can be integrated into the recycling education efforts described above.

Recycling and Composting

Based on other similar programs such as Jepson Prairie Compost in Yolo County and Sonoma Compost in Sonoma County, mixed organics can be processed into compost for about \$40/ton, with an annual cost of about \$1.4 million. With offsetting savings from reduced landfill tipping fees, this program could result in little to no net cost increase. Funding necessary for the collection and processing of the organics can be obtained with solid waste collection fees.

In order for this program to increase organics diversion and composting beyond the levels already achieved, focused efforts are necessary to inform and increase participation by residents and businesses. These outreach efforts to increase organics diversion can be combined with other waste recycling goals for a more cost-effective outreach effort. Educational cost estimates are based on spending \$5 per household per year above current recycling educational expenditures. This cost is included with Action SW1.1.

³⁹ EPA's Global Warming—Waste, "Measuring Greenhouse Gas Emissions from Waste" http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_Form.html, see Appendix I for calculations.

Emissions Reduction Summary – Reduce Consumption and Solid Waste

Solid Waste	Implementer	Feasibility	Potential tons GHG reduced by 2020
Objective SW1. Achieve overall waste diversion of 75% to 90% by 2020.			
Increasing overall waste diversion (Action SW1.1)	UVWMA, N-VWMA, County, cities	Moderate	90,000 tons/year (reductions not counted toward target)
Reducing the amount of waste generated (Action SW 1.2)	UVWMA, N-VWMA, County, cities	Easy to Difficult	To be determined
Reusing products and packaging (Action SW1.3)	UVWMA, N-VWMA, County, cities	Moderate	To be determined
Recycling or composting (Action SW1.5, SW1.6)	UVWMA, N-VWMA, County, cities	Moderate	3,700 tons/year (reductions not counted toward target)

DRAFT

Goal 4. Conserve Agriculture, Natural Resources, and Urban Forests (AN)

Globally, about 25 to 30 percent of annual GHG emissions are due to deforestation. The carbon dioxide sequestered in soil, trees, and other vegetation is released into the atmosphere when land is converted to other uses, including agriculture. While the agriculture and forest sectors represent less than 4 percent of GHG emissions in Napa County, they have the potential, with new practices, to act as a sink, tying up or sequestering GHG emissions from the atmosphere in the form of soil and wood carbon.

Agriculture

Agricultural areas are widespread throughout the County, with vineyards and rangeland countywide. Of Napa County's approximately 485,000 acres, 51,000 acres (or 10.5 percent of the total area) are active agricultural lands consisting primarily of vineyards with smaller areas of crops and orchards. The County has approximately 53,800 acres of existing grazing land.⁴⁰

While Napa County is known for its wine grape growing, a small variety of agricultural crops are also grown, including walnut and olive orchards, strawberries, artichokes, among others.⁴¹ Agriculture is the leading source of revenue for Napa County.

Total GHG emissions from the agricultural sector are a result of a complex network of sources including livestock, agricultural equipment, fertilizer application, soil tillage, crop residue burning, land conversion for agricultural use, processing, refrigeration, and distribution.⁴² For this reason, calculating the GHG emissions from the agricultural sector of Napa County is more demanding than for other sectors in this Plan.

Given this complexity of calculations, agriculture emissions for Napa County are not determined except for the CO₂ equivalent emissions from tractors and other farm equipment. In 2005, the BAAQMD estimated these emissions at 33,046 metric tons, which is approximately 3% of the total countywide GHG emissions.

In general, methane gas from livestock and manure is 23 times more potent than CO₂ and therefore can be a significant contributor of GHG emissions. In Napa County, however, given the very small number of livestock (approximately 9,000),⁴³ the methane gas is considered insignificant. The Napa County General Plan Environmental Impact Report (EIR) explored four land use scenarios for future development in the County. Each scenario evaluates environmental impacts resulting from projected development. The scenarios range from a minimum development, or "No Build," scenario to a "Build Out" scenario.

⁴⁰ Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

⁴¹ Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

⁴² Winery emissions related to fermentation are not relevant to this analysis since only use of ancient carbon related emissions are considered.

⁴³ US Department of Agriculture. *2007 Census of Agriculture: Napa County California*. Available online at: www.agcensus.usda.gov

Ultimately, the Draft EIR determined that less future development will promote future GHG emission reduction goals.⁴⁴

The proposed actions will not only reduce emissions from current agricultural practices, but will also act to remove and sequester carbon dioxide from the atmosphere. That is, the actions move toward a net reduction of atmospheric carbon dioxide. This is a feature that makes agriculture and forestry unique: they can act as carbon “sponges” to soak up carbon dioxide. So these actions not only reduce emissions to zero, they go “beyond zero” to create carbon sinks.

One-sixth of GHG emissions from agriculture are from burning or fossil fuels to run machinery and vehicles. If other aspects of the farming industry are incorporated, such as food production and transportation, agriculture is associated with almost one-quarter of US emissions.⁴⁵ The farther food travels to Napa’s cities and county from its source, the more fossil energy is expended and the more carbon is released into the atmosphere. Researchers estimate that it takes about 10 calories of fossil energy to put one calorie of food on our plates in North America. About 70 percent of these calories are dedicated to transportation and processing.⁴⁶

Organic and local food practices, however, produce less energy to maintain, produce fewer GHG emissions, avoid the use of chemical fertilizers and are more resilient in the face of drought of any kind, including that brought on by climate change.⁴⁷ Sustainable agriculture and localized food systems have the potential to mitigate nearly thirty percent of global GHG emissions and save one-sixth of global energy use.⁴⁸

Woody and herbaceous plants, manure, and algae (or biomass) generates energy when burned that can be used directly as heat or can be converted into electricity. Some types of biomass can be used directly as heat or can be converted into electricity. It is considered a carbon neutral energy source.⁴⁹

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Agricultural Waste Strategies

Agricultural “waste” is a resource that can be used to create additional revenue, increase soil health, and increase yields.

- Create on-farm and centrally located facilities to process all residential “green can” waste, as well as equestrian and agricultural waste.
- Process this waste in anaerobic digesters and use in energy production and soil management.

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⁴⁴ Napa County. *Napa County General Plan Draft Environmental Impact Report*. February 2007.

⁴⁵ Climate Action Project. *Agriculture and Rural America*. October, 2008. Available online:

www.climateactionproject.com.

⁴⁶ Pimentel, David and Marcia H. Pimentel. *Food, energy, and society*. Boca Raton, Florida: CRC Press, 2008.

⁴⁷ *Regenerative Organic Farming: A Action to Global Warming*. LaSalle, T., Ph.D. and Hepperly, P., Ph.D. 2008 Rodale Institute. www.rodaleinstitute.org/files/Rodale_Research_Paper-07_30_08.pdf

⁴⁸ Ho, Dr. Mae-Wan and Lim Li Ching. *Mitigating Climate Change through Organic Agriculture and Localized Food Systems*. ISIS Report 31/1/08

⁴⁹ ICLEI – Local Governments for Sustainability. Biomass Technologies.

Objective AN1: Encourage responsible and sustainable agricultural and landscaping practices.

Actions described below will encourage responsible and sustainable agricultural and landscaping practices by:

- Supporting local agriculture, food production, and community gardens
- Promoting water conservation

Supporting Local Agriculture, Food Production, and Community Gardens

ACTION AN1.1: Adopt policies and ordinances that support local agriculture, food production, and community gardens. Support efforts by local growers and restaurants to produce and use locally grown food products, and remove associated regulatory hurdles.

City of Napa

- Encourage buying local agricultural products through farmers markets held in the downtown area.

City of St. Helena

- Promote edible landscaping.

ACTION AN1.2: Support efforts by local growers and restaurants to produce and use locally grown food products and remove associated regulatory hurdles. (See also T10 and AN1.)

City of St Helena

- Require GHG analysis for conversion of woodlands to agriculture.
- Investigate using St. Helena wastewater treatment plant spray field for production of crops that can be converted to biofuels.

Promoting Water Conservation

ACTION AN1.3: Adopt water efficient landscape ordinances that promote climate-appropriate plants, efficient irrigation, and non-potable water sources.

American Canyon

- See BE1.3.

City of Calistoga

- Adopt an ordinance allowing grey water systems.

City of St. Helena

- Investigate impacts of water diversion to Napa River.
- Adopt and enforce a better landscape ordinance.

Natural Resources

Water is a valuable natural resource in Napa County. Many of the areas in the eastern regions of the county have very limited water resources, and in some areas where there is water, the boron concentration is quite high and too high for crop production.⁵⁰ There are a total of 22,431 acres of water in the county, or 4.43 percent of the total land.⁵¹ Suitable climate and an irrigation water source will likely continue to support future conversion of land.

Access to clean water, energy, mineral resources, and availability of productive land are all threatened by changes in climate. The warmer winter and spring temperatures of recent years could adversely affect the capacity and reliability of the California water system with respect to water shortage and flood management, and requires changes in water reservoir management rules.

Urban water conservation, reclamation and reuse of water, land and water use, and drainage management protect and conserve valuable water resources. Water reclamation systems provide an exemplary infrastructure to use water efficiently. Gray water is tap water soiled by use in washing machines, tubs, showers and bathroom sinks. It is not sanitary, but it is also not toxic and generally disease free. Gray water reclamation is the process by which households make use of gray water's potential instead of simply piping it into overburdened sewage systems with all water that travels down the drain.

Reducing water used outdoors can make the biggest difference in saving water in Napa County. Water efficient landscaping opportunities include: water-efficient irrigation systems and climate appropriate plants and trees. These design decisions are based on the following principles: proper planning and design, soil analysis and improvement, appropriate plant selection, practical turf areas, efficient irrigation, use of mulches and appropriate maintenance.⁵²

Benefits of this type of landscaping include: conservation of natural resources, decreased energy use, and reduced runoff and irrigation water that carries top soils, fertilizers and pesticides into lakes.

Objective AN2: Reduce water use and protect local water resources.

Actions described below will reduce water use and protect local water resources by:

- Reducing demand of potable water and developing water service and infrastructure

Reducing demand of potable water and developing water service and infrastructure

ACTION AN2.1: Develop and implement water conservation plans that include financial incentives, educational programs, and ordinances that reduce the per capita demand of potable water.

⁵⁰ Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

⁵¹ Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

⁵² US Environmental Protection Agency. *Water-Efficient Landscaping: Preventing Pollution and Using Resources Wisely.*

American Canyon

- See BE1.3.

ACTION AN2.2: Develop and enhance recycled water service and infrastructure to serve all areas of Napa County.

Financing Options

Also known as Mello-Roos, Community Facilities District Funding provides a means through which local government agencies obtain funding for public improvements, such as water and wastewater systems, roads, schools, etc. The district sells bonds to finance the improvements, and taxes from real property owners in the district pay off the principal and interest on the bonds. Formation requires two-thirds majority vote of residents within the boundaries of the district. These bonds can pay for facilities that transmit and distribute potable and nonpotable water.

In addition to Community Facilities District Funding, the California Department of Water Resources provides grants annually for water use efficiency projects. The Bay Area Air Quality Management District periodically provides grants to help fund climate protection programs and policy development projects in the Bay Area. The Community Foundation provides funding, as well, to communities who are interested in exploring innovative planning projects and processes.

Forests

Forests and urban trees reduce atmospheric carbon dioxide (CO₂) through sequestration and other greenhouse gases by conserving energy used for space heating and cooling. Carbon sequestration is the process by which CO₂ is transformed into above- and below-ground biomass and stored as carbon.

Conversion of forestland to development and agriculture releases CO₂ and also diminishes the future capacity of the forest to remove CO₂ from the atmosphere. The County has roughly 40,000 acres of land that is capable of growing timber, with 30,000 acres that are currently functioning as timberland.⁵³ Commercial timber species include Coast Redwoods, Incense Cedar, Douglas Fir, Western Red Cedar and Jeffrey Pine, among many others.

These lands can be conserved to minimize the CO₂ emissions associated with conversion of timberland to other uses, such as vineyards. Additionally, land can be restored and managed to remove additional CO₂ from the atmosphere, while also providing wood products and many other public benefits. The proposed actions to preserve, restore, and manage the County's forestlands and change impactful agricultural practices will result in minimizing emissions and maximizing carbon uptake.

By fostering and restoring forests and other terrestrial ecosystems that offer significant carbon mitigation potential, Napa's cities and County will reduce total GHG emissions and protect valuable natural resources. Major contributors to GHG emissions, such as vehicle traffic and energy use, can be reduced on a local level through the implementation of sustainable development policies.

⁵³ Napa County Baseline Data Report, Chapter 10, Agricultural Resources.

Planting trees in communities can make a difference when it comes to protecting the climate and mitigating the impacts of climate change.⁵⁴ Planting trees strategically to shade east and west walls of residential buildings would reduce air conditioning energy use. Shade trees also dramatically reduce the heat island effect of urban areas, which refers to built up areas that are hotter than nearby rural areas.⁵⁵ Implementing living (or green) roofs and transitioning from dark surfaces to light surfaces help to keep urban area temperatures cool and can reduce the summer peak electric load.⁵⁶ If tree planting actions were applied statewide, it is estimated that the amount of total CO₂ reduction annually would be 3.6 percent, equivalent to retrofitting homes with energy-efficient electric appliances.⁵⁷

There are many best practices throughout the country that provide guidance to Napa's cities and County. The City of Los Angeles developed a method for locating potential tree-planting sites in urban areas, for example. The efficacy and cost-effectiveness of various forest management activities requires the development of reliable, accepted carbon measuring and monitoring protocols.⁵⁸ The US Forest Service Urban Forest Project Reporting Protocol provides detailed guidance to insure that tree planting projects meet eligibility requirements, produce GHG reductions that are additional to a baseline, are sustained for at least 100 years, and do not detract from management of existing trees.

Similarly, the Board of Forestry (BOF) has been involved in the development of forest protocols. The California Air Resources Board's (CARB) Scoping Plan states that the forest sector must achieve a "no net loss" target, which means it must achieve reductions in CO₂ equivalent to the current statewide forest carbon budget. BOF has developed strategies to reach this target and plans to use a combination of regulatory, statutory and incentive-based approaches to meet these goals.⁵⁹

Objective AN3: Protect and increase the amount of vegetation and biomass in soil and reduce emissions from agricultural sources.

Actions described below will protect and increase the amount of biomass in soil and reduce emissions by:

- Promoting sustainable business
- Assessing impacts on carbon sequestration
- Protecting habitat

⁵⁴ US Forest Service, Climate Change Resource Center, Urban Forests and Climate Change, August 2009.

⁵⁵ US Environmental Protection Agency. Heat Island Effect. September 2009. Available online at: www.epa.gov.

⁵⁶ Columbia University Center for Climate Systems research and Nasa/Goddard Institute for Space Studies. *Mitigating New York City's Heat Island with Urban Forestry, Living Roofs, and Light Surfaces: New York City Regional Heat Island Initiative*. The New York State Energy Research and Development Authority, June 2006.

⁵⁷ US Forest Service, Climate Change Resource Center, Urban Forests and Climate Change, August 2009.

⁵⁸ California Energy Commission. *Methods for Measuring and Monitoring Forestry Carbon Projects in California*. 500-04-072F. April 2004.

⁵⁹ Board of Forestry, Climate Change Board. Available online at: www.fire.ca.gov.

Promoting sustainable business

ACTION AN3.1: Support and promote the Napa Green Certified Winery Program and the Napa Green Certified Land Program ("Fish Friendly Farming"), as well as other practices.

Assessing impacts on Carbon Sequestration

ACTION AN3.2: Assess the positive or negative impacts of land use changes, new vineyards, and urban development on carbon sequestration.

Unincorporated Napa County

- Quantify changes in sequestration and GHG emissions anticipated from all discretionary projects consistent with General Plan Policy CON-65, except in the case of projects which qualify as categorically exempt pursuant to the local procedures for implementing CEQA. County planning staff is also collecting data on GHG emission reduction strategies that are being implemented voluntarily by project applicants, with the intention of using this data to develop new requirements (if necessary) to ensure that all discretionary projects are implementing best practices to reduce GHG emissions by January 2011.

Protecting habitat

ACTION AN3.3: Adopt policies, ordinances, and plans that create and enhance urban forests and greenways.

City of Yountville

- Develop an urban forest management plan with the Town's arborist.

American Canyon

- See TM1.1.

ACTION AN3.4: Adopt policies and ordinances to protect habitat and mitigate the conversion of oak woodlands and other important plant communities by permanently protecting similar habitats.

County of Napa

- In unincorporated Napa County, discretionary projects proposing to remove oak woodlands or other important plant communities are required to replace lost habitats or permanently protect like habitats at a 2:1 ratio. County planning staff is currently developing a voluntary oak woodlands management plan, outlining incentives and best practices for private land owners as well as standard mitigation requirements and restoration/conservation priorities (General Plan Action Item CON NR□7).

Financing

The US Forest Service may have the capacity to collaborate with the County and cities of Napa to implement habitat protection and urban forestry programs. Additionally, funds provided by the Bay Area Air Quality Management District, which are provided periodically, may be applicable to urban forestry and habitat restoration projects.

Emissions Reduction Summary

Given the complexity of current and projected GHG emission calculations and associated funding, proposed actions to reduce GHG emissions sourced by agricultural, natural resources and forest have not been quantifiably assessed to determine potential implementers, feasibility, potential tons of GHG reduced, co-benefits, and estimated investment of each action.

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Goal 5. Increase Community Engagement (CE)

Community engagement involves educating citizens about policy issues and including them in problem-solving and decision-making processes. It is a multifaceted, ongoing practice of moving communities towards change for the benefit of the entire community.

Research demonstrates that the strongest plans stem from planning processes that involve a broad array of stakeholders—partnerships with businesses, organizations, and individuals throughout the cities and County of Napa. Stakeholders include environmental groups; affordable housing groups; business groups; local elected officials; agriculture groups; seniors' groups; development groups; neighborhood groups; and local government departments. Comprehensive community engagement includes involving those who may be historically left out or who are less oriented to action.

Any action plan adopted must foster a collaboration of citizens, businesses and green initiative groups who become engaged and contribute to a sustainable future. Community engagement activities will also help ensure the implementation of the Climate Action Plan over the course of the next 10 years. Broad public involvement allow planners to understand problems related to climate action and protection policies and programs, thereby allowing them to develop a strong set of policies for dealing with them.

Community engagement activities and partnerships are part of the planning process for City and County governments. Consequentially, there tends to be a framework in place when jurisdictions decide to develop a public outreach campaign. Existing frameworks and partnerships can be built upon to promote emission reductions and strategies.

Objective CE1: Market programs and conduct community outreach to increase participation in GHG reduction efforts.

GHG emissions reduction begins with a fundamental understanding among community members regarding the importance of and need to engage in behavioral and lifestyle changes. An inclusive community outreach plan will reflect the ideas and culture of the entire community and allow all to share ideas and feel comfortable. Achieving an effective and inclusive community outreach program does not happen overnight. It takes time, energy and commitment to build strong and effective participation in GHG reduction efforts.

Many communities choose to develop a position that is responsible for advocacy, facilitating implementation of the Climate Action Plan and outreach, among other tasks. The City of Richmond, for example, hired a Sustainability Coordinator to oversee the City's sustainability services and to coordinate regional efforts. The County and cities currently do not have a similar position. Comprehensive community engagement, as outlined in this plan, is a multi-faceted undertaking that includes advocacy, research, and outreach. Funding resources could be pooled to support a regional entity that is responsible for climate-related programs and activities.

ACTION CE1.1: Partner with community-based non-profit organizations, schools, and others engaged in public outreach and education efforts that broaden community involvement in reducing greenhouse gas emissions.

City of Calistoga

- Sponsor regular educational presentations for the community, e.g., Master Gardener (Drip Irrigation, Composting, Waterwise Gardening), PGE, Green Building. The Calistoga Family Center can sponsor seminars in Spanish.
- Assist in the sponsorship of community events and campaigns that address global warming, renewable energy, "green business," etc.
- Draft correspondence, reports, news releases, brochures, fact sheets, opinion pieces, advertising, etc. to aid in the implementation of CAP measures, particularly those related to outreach and advocacy.

City of St. Helena

- Hire a GHG Reduction coordinator to implement programs.

ACTION CE1.2: Partner with utilities, energy service providers and community-based non-profit organizations to encourage participation in incentive programs that improve energy and water efficiency.

City of Calistoga

- Develop replacement programs to provide energy-efficient lighting and water efficient appliances and fixtures.

City of St Helena

- Coordinate and promote public information—what homes and businesses can do locally—voluntary vs. mandatory.
- Offer green products and services in exchange for community volunteerism.

ACTION CE1.3: Partner with public agencies, non-profit organizations and private employers to offer incentives aimed at reducing drive-alone commuting and promoting car-free tourism.

City of Calistoga

- Establish relationships with PG&E to help Calistoga achieve its emission reduction goals.

ACTION CE1.4: Promote programs designed to advance sustainable business practices, such as the Napa County Green Business Program and sustainable agricultural practices, such as the Napa Green Certified Land Program.

Objective CE2: Engage and advocate for collaborative policy and legislative actions at regional, state, federal and global levels to reduce GHG emissions.

The implementation of a climate action plan often requires unique and innovative skills. It presents an opportunity to develop the local and regional workforce. The Center for Urban Economic Development at the University of Illinois found that the Chicago Climate Action Plan presented an opportunity to create green jobs, reducing poverty while revitalizing Chicago's economy. The Center identified areas where an economic and workforce

development strategy may be targeted to ensure a sufficient supply of skilled workers and open up pathways to “green collar” jobs and careers for disadvantaged segments of the community.

They determined that the implementation of the Action Plan would create the following new jobs: weatherization work; renewable energy installation, including solar, geothermal and “small wind;” transit construction, operators and maintenance workers; train conductors and yard workers; renewable energy development; processing, handling and resale / remanufacture of materials; water infrastructure construction, green roof design, installation and maintenance; and indirect jobs in program administration, warehousing and materials. The following jobs were determined to be critical to carrying out climate actions in the plan: “green” construction: building maintenance and operations workers: energy engineers: “smart grid” installation workers: urban planners and designers: industrial engineers: civil engineers and technicians: and landscape designers and architects.

The US Mayors Climate Protection Agreement illustrates the ability of local governments to advocate for emissions reduction at a national and international level. In November 2007, mayors from across the country gathered in Seattle to sign the Agreement. To date, the Agreement has been signed by more than 1010 mayors. By signing the agreement, the mayors commit to three actions:

- Strive to meet or beat the Kyoto Protocol targets in their own communities, through actions ranging from anti-sprawl land-use policies to urban forest restoration projects to public information campaigns;
- Urge their state governments, and the federal government, to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol—7% reduction from 1990 levels by 2012; and
- Urge the US Congress to pass the bipartisan greenhouse gas reduction legislation, which would establish a national emissions trading system.

ACTION CE2.1: Engage and assist local agencies and utility companies toward achieving greenhouse gas reduction targets.

ACTION CE2.2: Support United States participation in international greenhouse gas reduction efforts.

City of Calistoga

- Educate City Commissions, Committees and Boards in GHG reduction measures. Once educated, City Commissions, Committees and Boards shall periodically review and discuss Citywide GHG reduction efforts and status.
- Form a dynamic relationship with the Calistoga Joint Unified School District to promote green education.

ACTION CE2.3: Seek long-term actions by investing in workforce development, partnering with local educators and institutions, and adjusting public policy when warranted by scientific findings.

Costs and Funding Opportunities

Resources to engage the community and promote reduction strategies could be pooled from various partnerships in the region including “Climate Bay Area,” a new (end of 2009) region-wide clearinghouse for climate action planning throughout the Bay Area. There are currently several organizations and entities who are undertaking different public campaigns. By combining efforts and focusing key and common messages, cities and the County of Napa would likely have little need for additional funding to support this action. Organizations such as Sustainable Napa County, the Napa Valley Farm Bureau, the Napa Valley Vintners, The Community Foundation of Napa Valley and utility companies, among others, have a common message—reduce energy use, drive less, live or operate sustainably. Each of these actions reduces GHG emissions.

The development of the local workforce in Napa necessitates the cooperation and support of all entities, employers and education services, among others. There are funding opportunities available through the American Recovery and Reinvestment Act of 2009 that support communities building a “green collar” job base.

Emissions Reduction Summary

Given the complexity of current and projected GHG emission calculations and associated funding, proposed actions to reduce GHG emissions by engaging the community and advocating for collaborative policy and legislative actions at regional, state, federal and global levels to reduce GHG emissions, have not been quantifiably assessed to determine potential implementers, feasibility, potential tons of GHG reduced, co-benefits, and estimated investment of each action.

Goal 6. Enhance Local Government Operations (LG)

Napa County's five cities' and County's municipal operations generated about 14,700 tons of greenhouse gas in 2005, as shown in the table that follows. Emissions from Napa County municipal operations for all jurisdictions account for about 1.25% of Napa County's total emissions. This percentage falls within the 1-5% range that is typical for California local government emissions, compared with their respective overall community emissions.

As a minor contributor to total emissions, actions to reduce municipal energy use will have a limited impact on Napa County's overall emission levels. However, municipal actions can help reduce local government's operating costs and have an important symbolic value demonstrating government leadership that extends beyond the amount of emissions actually reduced.

Napa local governments follow the Cities for Climate Protection® five-step program for reducing emissions for both municipal operations and community wide. The cities and the County have completed the first step – performing an inventory of their GHG emissions for municipal operations.

The next step is making a plan for reducing emissions in municipal operations such as the County of Napa and City of St. Helena have done. The process of developing such plans involves detailed financial analyses based on the inventory, target, municipal measures completed, underway and planned, and in-depth discussions with staff about the various options for reducing GHG emissions.

The cost for a consultant to complete such a plan depends in part on the size of the operations, which correlates to the population served. For a city like St. Helena, with a population of about 6,000, the cost for a municipal operations climate plan is approximately \$17,000. For the County of Napa, with an incorporated area population of about 27,500, the cost for a plan is approximately \$40,000. Developing such detailed operational plans for government operations for individual Napa local governments was beyond the scope of this project.

GHG Emissions for Municipal Operations 2005 (metric tons of CO2e)

	Yountville		Calistoga		American Canyon		St Helena		City of Napa		County of Napa		Total Napa Co. Muni Operations	
	CO2e	% Total	CO2e	% Total	CO2e	% Total	CO2e	% Total	CO2e	% Total	CO2e	% Total	CO2e	% Total
Buildings	138	44%	117	14%	56	--	197	19%	556	25%	4,893	51%	5,957	40%
Vehicle Fleet	46	15%	376	45%	na	--	166	16%	955	43%	1,823	19%	3,366	23%
Streetlights	22	7%	31	4%	50	--	66	6%	512	23%			681	5%
Water/Sewage	106	34%	303	37%	627	--	343	34%	157	7%			1,536	10%
Commute							247	24%			2,879	30%	3,126	21%
Solid Waste							3	0%	43	2%			46	0%
Total GHG Emissions	312		827		733		1,022		2,223		9,595		14,712	

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Objective LG1: Reduce fossil-fuel consumption by local government operations.

ACTION LG1.1: Transition government fleets to vehicles powered by clean, renewable energy sources, smaller and more efficient vehicles, and facilitate trip reduction and non-vehicle alternatives.

City of Yountville

- Provide two electric vehicles as part of the Town fleet.

American Canyon

- See TM1.1.
- Purchase hybrids and low-emission equipment to replace the existing fleet for the past 4 years.

City of Calistoga

- Establish anti-idling policies for City vehicles/drivers.

ACTION LG1.2: Install electric vehicle charging stations with funding from State and Federal sources.

ACTION LG1.3: Encourage alternatives to employee use of single-occupancy vehicles by providing secure bicycle parking, preferential parking for carpools and vanpools, commuter information, alternative work schedules/practices for government employees and transit incentives.

City of Calistoga

- Encourage greater use of bicycles and other non-motorized vehicles for business activities.

ACTION LG1.4: Adopt hours of operations and schedules for public meetings which are coordinated with public transit service availability.

Objective LG2: Improve the energy efficiency and reduce greenhouse gas emissions of City and County facilities and operations.

ACTION LG2.1: Perform audits and regularly monitor the effectiveness of City and County energy-efficiency implementation measures and adapt them to meet targets.

City of Calistoga

- Create hydrothermal heating district to determine feasibility of heating downtown structures.

American Canyon

- See TM1.1 and BE3.1.

City of St Helena

- Implement a means of tracking GHG reduction results from green building construction.

ACTION LG2.2: Convert street lighting, water pumping, water treatment, and other energy-intensive operations to more efficient technologies, and use renewable energy where feasible.

City of Calistoga

- Incorporate the use of "solartube" or comparable light-magnifying skylights that reduce the use of electric lighting.
- Create strategies to reduce pumping of water in the City's water transmission lines through the creation of a water conservation management plan.

American Canyon

- See TM1.1 and BE3.1.
- Improve the new American Canyon city hall (which purchased an existing, relatively new office building), to include energy-efficient lighting systems and HVAC system. Energy-efficient appliances were installed, as were lighting tubes to provide natural lighting for interior office spaces. Install water conserving toilets and sink faucets, as well as low-VOC furniture and carpets. Institute policies to further reduce energy use for day-to-day operations, such as turning all computers and monitors off at the end of each day.

City of St Helena

- Implement St. Helena action plan for city owned buildings and property.
- Encourage employees to dress appropriately for the weather; discourage use of individual space heaters.

ACTION LG2.3: Ensure that new government facilities incorporate cost-effective strategies for reducing greenhouse gas emissions, conserving energy and water, and utilizing sustainable construction practices.

City of Calistoga

- Use a programmable thermostat, ceiling fans, evaporative coolers and economizers. Provide shade for HVAC condenser, especially roof-top fixtures. Use double paned windows on windows. Check landscape sprinkler systems for proper watering cycle and to prevent runoff and consider conversion to drip where feasible. Make sure there is a recycle bin beside every garbage bin in town. On City properties and school properties, plant bee- and butterfly-attracting plants to help mitigate decline in the number of pollinating insects nationwide in last couple of years.
- Limit heating thermostat set points to 68 degrees and cooling thermostat set points to 75 degrees in City buildings.
- Ensure that all interior and exterior lighting utilizes energy-efficient technology (e.g., Energy Star CFL bulbs and fixtures, LED lights). Modify City facilities lighting systems to increase energy efficiency. Replace older T-12 fluorescent lighting with energy efficient T-8 or T-5 fixtures with electronic ballasts.

American Canyon

- See SW1.1.

ACTION LG2.4: In City and County purchasing decisions, consider carbon emissions from the production, transportation, use, and disposal of goods as a criterion.

City of Calistoga

- Develop policies that encourage purchasing supplies that are made from recycled products and encourage reuse of certain supplies. City should consider prohibition of individual bottles of water, disposable cups, plates, cutlery, disposable pens and pencils and should encourage the use of personal eating and writing implements.

Objective LG3: Reduce solid waste from City and County operations and facilities.

ACTION LG3.1: Recover 70% to 85% of all waste generated in City and County operations and establish a user-friendly, comprehensive recycling program that involves all departments and facilities.

City of Napa

- Recycle waste materials sourced by city operations.