Chapter 2 – Unincorporated Shasta County

PURPOSE

This chapter serves as the Climate Action Plan (CAP) for unincorporated Shasta County. The County has developed this plan in order to contribute to the State's climate protection efforts and to provide California Environmental Quality Act (CEQA) streamlining benefits for new residential and commercial development projects within the community. As stated in State CEQA Guidelines Section 15183.5, for a qualified greenhouse gas (GHG) reduction strategy to provide streamlining benefits for a local jurisdiction, it needs to include the following elements:

- GHG emissions for the jurisdiction need to be quantified through a comprehensive and complete inventory effort. This means identifying and analyzing GHG emissions from specific actions or categories of actions;
- GHG emissions need to be quantified for both existing and anticipated emissions over a specified time period, that result from current and planned activities within the defined jurisdiction area;
- Establish a reduction target for the jurisdiction, below which the contribution to GHG emissions from activities covered by the plan would not be considered cumulatively significant. All assumptions and calculations in making this determination should be transparent. A margin of safety should be built into the plan as well;
- Specify policies, measures, or programs, including performance standards that would collectively achieve the specified emissions reduction level if implemented as a specific project requirement or across a community as an incentive program. An overall reduction plan needs to address existing as well as new development reduction strategies, and should rely primarily on mandatory measures;
- A clearly defined mechanism to monitor the plan's implementation progress toward achieving reduction levels, and to require amendment if the plan is not achieving specified levels.

The content of this chapter is structured to demonstrate compliance with these required elements and to provide the unincorporated County and community with a useful resource to implement these important actions.

GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of unincorporated Shasta County's communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual (ABAU) forecasts. Detailed information regarding the calculation and assumptions used in preparing the GHG emissions inventory and forecasts is provided in Appendix A.

GREENHOUSE GAS EMISSIONS INVENTORY

The 2008 GHG emissions inventory serves as the foundation of the unincorporated County's CAP. Using data collected from County departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG emissions generated within the County or as a direct result of County operations (even if outside unincorporated county areas) in the baseline year. This data allows the County to establish a baseline inventory and identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the County developed a *Total Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), transportation, waste, water, off-road vehicles/recreation, stationary sources (industrial), agriculture, and forestry. Due to a lack of jurisdictional control over the GHG emissions produced by agriculture, forestry, and stationary sources, these sectors are excluded from the *Jurisdictional Inventory*. Examples of permitted stationary sources that are not under the control of the County include cement plants, biomass facilities, and other industrial processes at manufacturing facilities. These facilities and equipment are permitted by the Shasta County Air Quality Management District, and their GHG emissions would be controlled under the jurisdiction of the Air Resources Board pursuant to AB 32. The Jurisdictional Inventory is used within this CAP for the purposes of developing reduction targets and strategies.

Total Inventory

In 2008, the community's total baseline emissions included 3,131,054 metric tons of carbon dioxide equivalent emissions (MT CO_2e). As shown in Figure 2.1 and Table 2.1, stationary sources generated the largest portion of emissions at approximately 2,271,000 MT CO_2e (73% of the total emissions). The transportation sector generated the second highest amount of emissions in the unincorporated County at approximately 243,700 MT CO_2e (8% of the total emissions), followed by energy consumption emissions at approximately 206,300 MT CO_2e (7% of the total emissions). The forestry sector contributed approximately 156,500 MT CO_2e (5% of total emissions), and the agriculture sector generated approximately 132,200 MT CO_2e (4% of total emissions). The off-road vehicle/recreation, solid waste, and water (including water and wastewater) sectors comprise the remaining 4% of the emissions inventory.

Jurisdictional Inventory

With the removal of the agriculture, forestry, and stationary source sector emissions, the community's baseline jurisdictional inventory lowers to 571,255 MT CO_2e in 2008. As shown in Figure 2.2, transportation generated 43% of total emissions, and energy production and consumption generated 36% of total emissions. The off-road vehicles/recreation sector contributed approximately 14%, and the waste sector contributed approximately 5% of total emissions. The water sector comprised the remaining 2% of total emissions.

Figure 2.1 – 2008 Total Greenhouse Gas Emissions Inventory by Sector

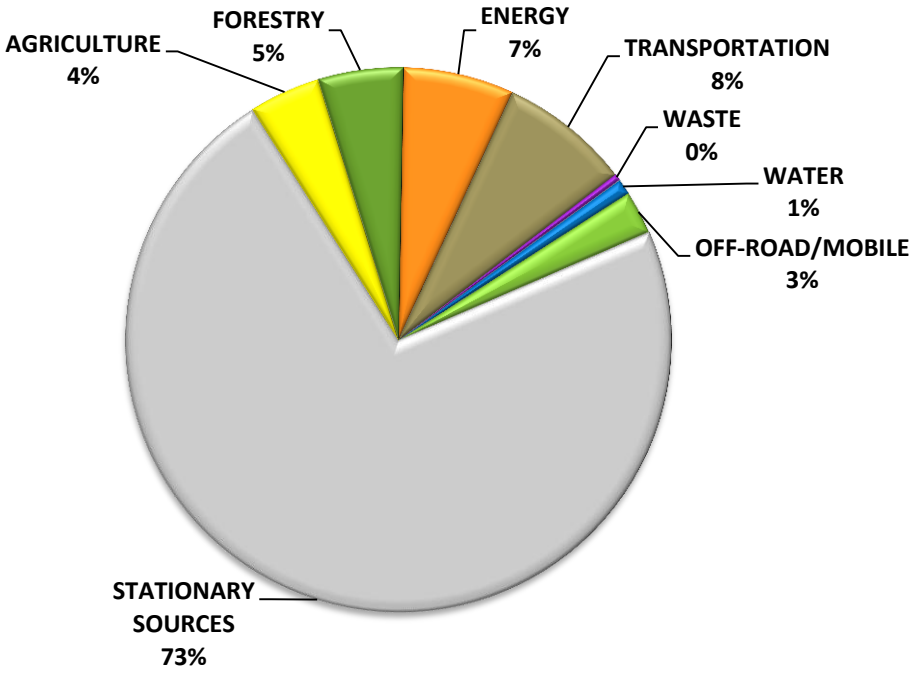


Figure 2.2 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector

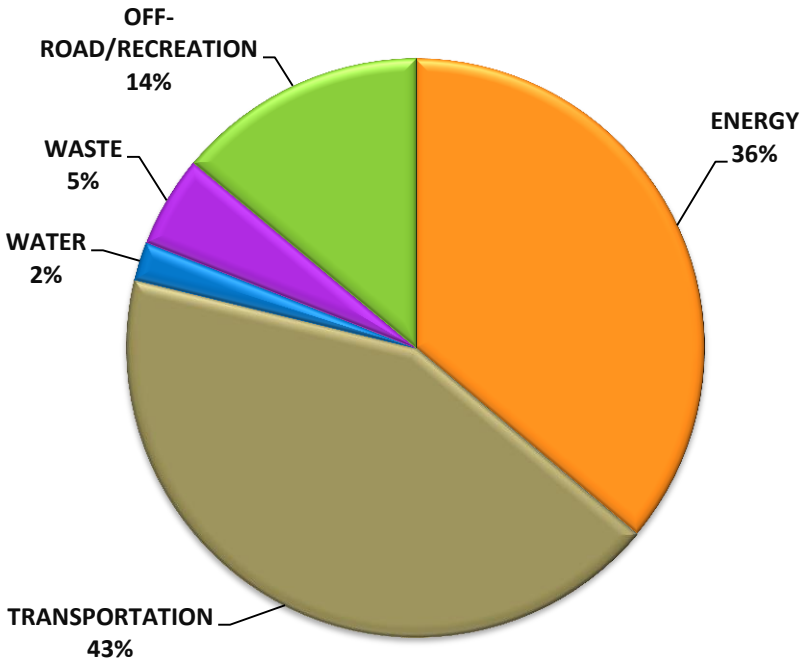


Table 2.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecasts: 2008, 2020, 2035, and 2050

Sector	2008 (MT CO_2e/yr)	2020 (MT CO_2e/yr)	% Change from 2008	2035 (MT CO_2e/yr)	% Change from 2008	2050 (MT CO_2e/yr)	% Change from 2008
Energy	206,309	226,132	10%	268,384	30%	317,117	54%
Transportation	243,668	275,326	13%	335,539	38%	397,095	63%
Solid Waste	29,233	31,498	8%	36,221	24%	40,627	39%
Water	12,342	13,298	8%	15,292	24%	17,152	39%
Off-Road and Recreation	79,703	85,878	8%	98,754	24%	110,767	39%
Stationary Sources (Non-Jurisdictional)	2,271,027	2,271,027	0%	2,271,027	0%	2,271,027	0%
Agriculture (Non-Jurisdictional)	132,234	132,234	0%	132,234	0%	132,234	0%
Forestry (Non-Jurisdictional)	156,538	156,538	0%	156,538	0%	156,538	0%
TOTAL INVENTORY	**3,131,054**	**3,191,931**	**2%**	**3,313,989**	**6%**	**3,442,556**	**10%**
JURISDICTIONAL INVENTORY	**571,255**	**632,133**	**11%**	**754,190**	**32%**	**882,757**	**55%**

BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Developing realistic GHG emission forecasts is a critical step in preparing a CAP. Emission forecasts estimate future emissions levels and provide insight regarding the scale of reductions necessary to achieve an emissions target. The County has prepared GHG forecasts for 2020, 2035, and 2050 horizon years.

The County's jurisdictional emissions are forecasted to be 632,133 MT CO_2e in 2020, 754,190 MT CO_2e in 2035, and 882,757 MT CO_2e in 2050, representing growth of 11%, 32%, and 55%, respectively, from the 2008 baseline emissions. Table 2.1 shows that while emissions are forecasted to increase in all sectors, transportation-related emissions are anticipated to increase at a greater rate than other sectors.

The forecasts were established using sector-specific growth factors (e.g., energy demand forecasts) or the County's population and employment growth projections. When based on population and employment growth projections, the GHG forecasts assume that baseline year activity intensity (e.g., waste generation per capita) will continue into the future. The business-as-usual GHG forecasts do not include emission reductions associated with State GHG reduction programs or implementation of the local actions described in this CAP.

The forecasts were developed for planning purposes, and represent the best-available estimates. Given the complexity of each emissions sector and the unpredictable nature of market conditions, human behavior and demographics, they will need to be updated in the future as data becomes available. The County will reevaluate the forecasts throughout the CAP implementation process.

ADJUSTED BUSINESS-AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

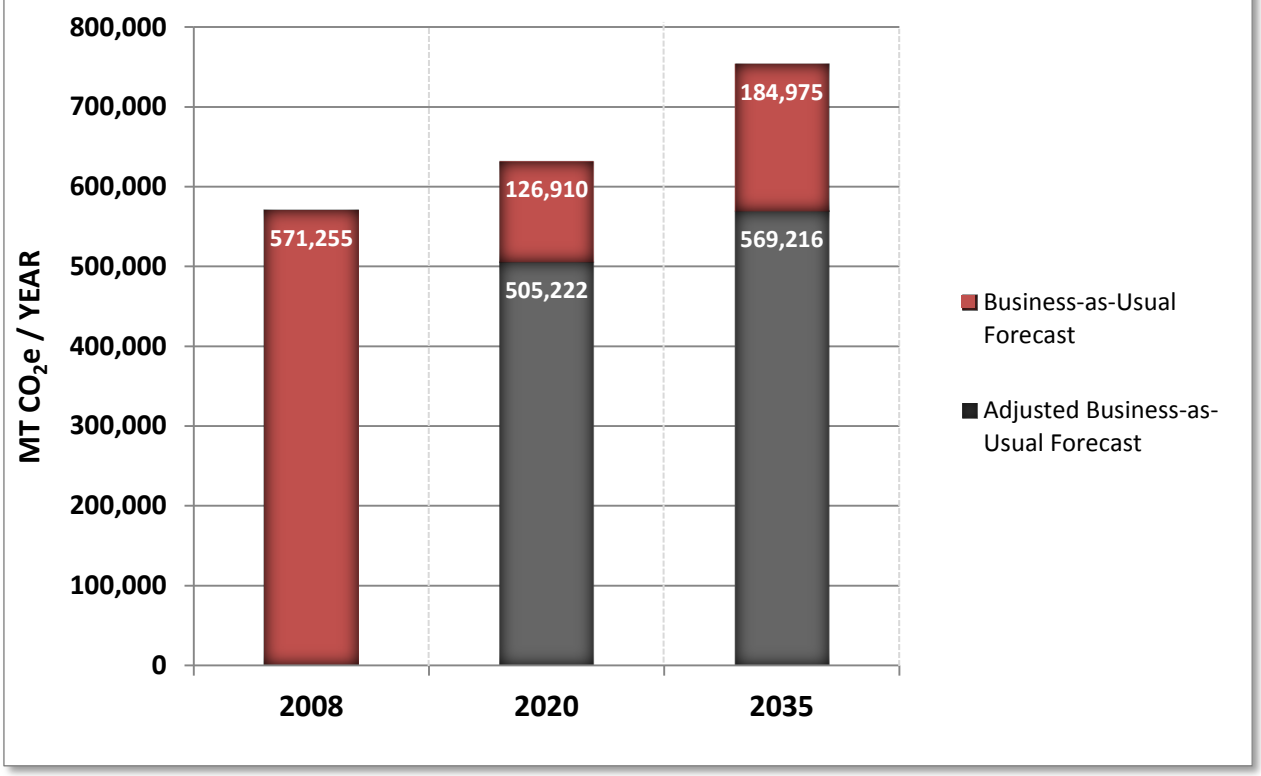
Table 2.2 describes the emission reductions anticipated to occur within the community through implementation of State and federal policies and regulations. The largest anticipated reductions are from State and federal fuel efficiency improvements to passenger vehicles and light-duty trucks. As residents and businesses replace older vehicles with newer ones, people will consume less fuel and generate fewer emissions per vehicle mile traveled. California's low carbon fuel standard will also reduce transportation-related emissions in the community by requiring a transition away from fossil fuels (i.e., gasoline and diesel) toward lower-carbon bio-fuels (e.g., ethanol). Implementation of the regional SB 375 Sustainable Communities Strategy will reduce vehicle emissions through development of effective transit and other alternative transportation systems and encouragement of low-carbon development. California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of PG&E's portfolio was generated from renewable sources. This increase in renewable electricity will reduce the community energy-related emissions. The medium- and heavy-duty vehicle efficiency improvements program and California Energy Code (Title-24) requirements for new construction will create smaller, but still important, communitywide emission reductions.

State and federal actions that reduce communitywide emissions in unincorporated Shasta County will make it easier for the community to achieve 2020 and 2035 emission reduction goals. As shown in Table 2.2 and Figure 2.3, with implementation of State and federal actions, communitywide emissions would be 505,222 MT CO_2e/yr in 2020 and 569,216 MT CO_2e/year in 2035.

Table 2.2 – Emission Reductions from State Actions 2020 and 2035

State Action	2020 Reduction (MT CO_2e/year)	2035 Reduction (MT CO_2e/year)
Passenger vehicle and light-duty truck fuel efficiency standards	35,421	66,274
Low Carbon fuel standard	15,173	16,146
Non-Pavley passenger vehicle efficiency programs	6,950	8,384
Medium- and heavy-duty vehicle efficiency improvement program	1,686	2,096
SB 375	21,208	45,065
2008 and 2013 California Title-24 standards	639	1,177
Renewable portfolio standard (33% by 2020)	45,832	45,832
Total	**126,910**	**184,975**

FIGURE 2.3 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSIONS



GREENHOUSE GAS EMISSION REDUCTION TARGETS

The County has selected emission reduction targets that are both ambitious and practical. The targets will allow the County to contribute to State climate protection efforts and are purposely set at levels that are likely to provide CEQA streamlining benefits to new development projects in the community. Unincorporated Shasta County's GHG reduction targets are as follows:

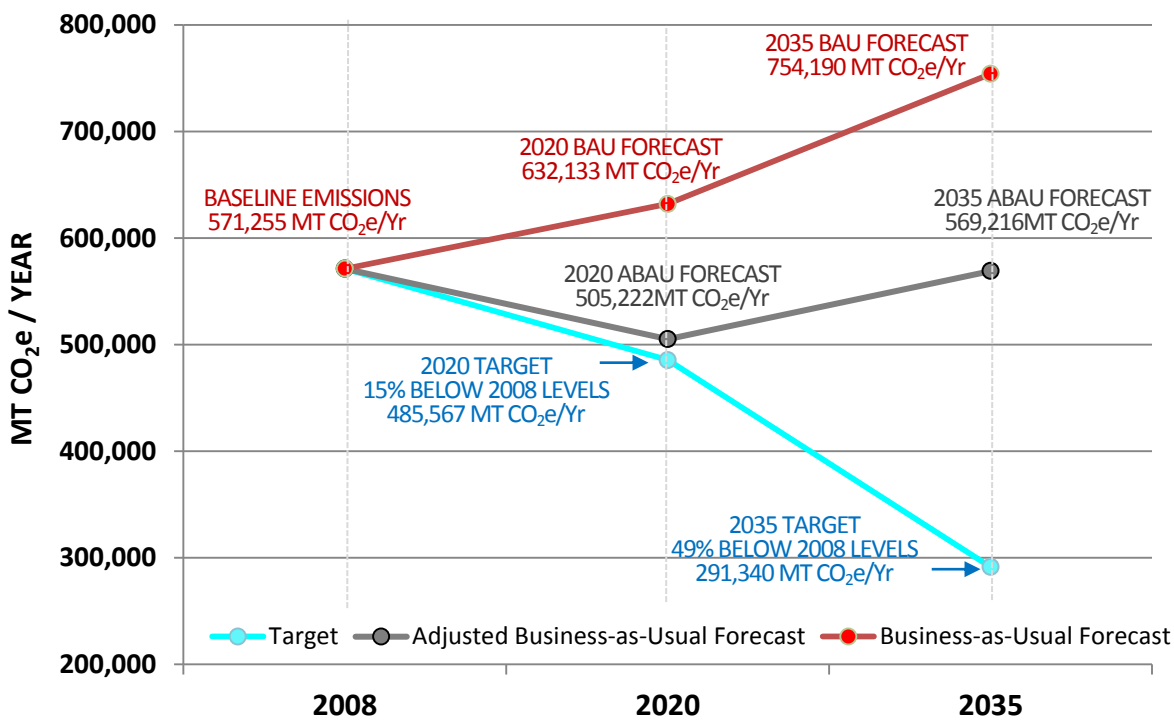
- Reduce community emissions to 15% below 2008 levels by 2020 (485,567 MT CO2e/yr)
- Reduce community emissions to 49% below 2008 levels by 2035 (291,340 MT CO2e/yr)
- Reduce community emissions to 83% below 2008 levels by 2050 (97,113 MT CO2e/yr)

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The County selected its 2020 target in order to contribute the community's fair share to this near-term effort. This target aligns with direction provided by the California Air Resources Board. Executive Order S-03-05 directs the State to reduce emissions to 80% below 1990 levels by 2050. In order to contribute to this long-term effort, the County strives to achieve an equivalent goal of reducing community emissions to 83% below 2008 levels in the same time period. To be on a path toward that goal, the County will need to reduce emissions to a level 49% below 2008 by 2035. Calculations showing the logic of this interim goal can be examined in Appendix C.

This CAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. While the County supports the goal of Executive Order S-03-05, it recognizes that estimating 2050 emission levels and reduction potentials are highly speculative. For this reason, the County has

chosen not to focus on the 2050 reduction target at this time. The County will regularly re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures accordingly.

FIGURE 2.4 - GREENHOUSE GAS REDUCTION TARGETS 2020 & 2035



GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the County will implement policies, programs, and other projects related to energy, waste, water, transportation, and carbon sequestration. This section provides a summary of the CAP's overall emissions reduction potential and describes the measures that the County will use to implement the local actions.

SUMMARY OF REDUCTIONS

Table 2.3 describes the emissions reduction potential of the County's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 28,097 MT CO_2e/yr. The waste-related measures are expected to provide the largest portion, 63%, of the local reductions. The energy-related measures will provide around 36%, followed by transportation (0.7%), water (0.3%), and carbon sequestration (0.1%). Table 2.4 and Figure 2.5 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 16.5% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by more than 8,000 MT CO_2e/yr. This estimated level of reduction conforms to the CEQA requirements for a qualified GHG reduction strategy and can be expected to provide streamlining benefits for compliant projects constructed within the jurisdiction prior to 2020.

In 2035, local actions are anticipated to reduce approximately 54,734 MT CO_2e/yr. The source of reductions is very similar to those in 2020, with waste and energy-related measures contributing the two highest proportions. Local and state actions are expected to reduce communitywide emissions to approximately 9.9% below 2008 baseline emissions levels; a level that falls short of the County's adopted 2035 target (49% below 2008 levels). The County anticipates that new technologies and State or federal policies will be developed and will assist the community to achieve this longer-term goal.

Table 2.3 – Quantified Greenhouse Gas Reductions

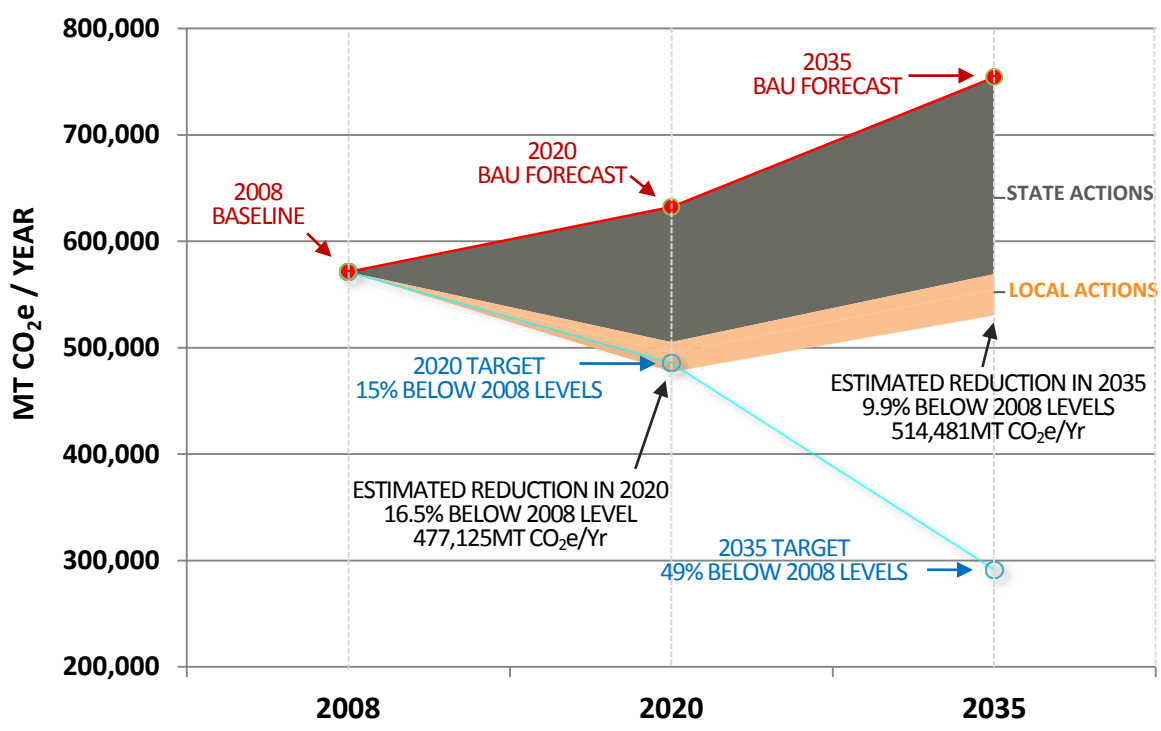
Sectors and Measures		2020 (MT CO_2e/yr)	2035 (MT CO_2e/yr)
Building Energy			
BE-1	Existing Buildings	201	452
BE-2	New Construction	0	0
BE-3	Commercial Indoor Lighting	24	65
BE-4	Energy-Efficient Appliances	1,443	9,459
BE-5	Smart Grid Integration	1,214	2,731
BE-6	Solar Water Heaters	886	2,336
BE-7	Solar Photovoltaic Systems	6,315	15,400
Subtotal		***10,082***	***30,443***
Water			
W-1	Residential Fixture and Fittings Retrofit	94	206
Subtotal		***94***	***206***
Solid Waste			
SW-1	Lumber Waste Diversion Ordinance	1,334	3,495
SW-2	Methane Recovery	16,360	20,051
Subtotal		***17,694***	***23,546***
Transportation			
T-1	Bicycle Lane Expansion	127	354
T-2	Commute Trip Reduction	70	116
Subtotal		***197***	***469***
Carbon Sequestration			
GI-1	Urban Forest	30	70
Subtotal		***30***	***70***
TOTAL LOCAL ACTION REDUCTIONS		**28,097**	**54,734**

Table 2.4 - Reduction Potential of County's CAP Measures

	2008	2020			2035		
	Baseline	BAU	ABAU	ABAU + Local CAP Measures	BAU	ABAU	ABAU + Local CAP Measures
GHG Emissions (MT CO2e/Yr)	571,255	632,133	505,222	477,126	754,190	569,216	514,481
Change from Baseline	NA	10.7%	-11.6%	-16.5%	32.0%	-0.4%	-9.9%
CAP GHG Reduction Targets	NA	Target = 15% below 2008 level	Does Not Meet Target	**Meets Target**	Target = 49% below 2008 level	Does Not Meet Target	Does Not Meet Target

Figure 2.5 demonstrates the relative contribution of State and the County's local actions. While the State actions provide the majority of reductions in 2020, the local actions are necessary to achieve the target. In 2035, State and local reductions increase in scale, but do not provide enough reductions to counteract the community's forecasted emissions growth or the more aggressive 2035 target.

FIGURE 2.5: EMISSIONS REDUCTION POTENTIAL OF STATE AND LOCAL ACTIONS



REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the County will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into five categories including: energy, water, waste, transportation, and carbon sequestration. Each category begins with an introduction followed by its corresponding reduction measures.

Measure Structure

To aid the reader and to facilitate implementation of the CAP, each measure contains the following information:

- **Emission Reductions -** Reduction potential values are provided after each measure title, and identify the estimated annual emission reductions anticipated in 2020 and 2035 in MT CO_2e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the County's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the County's actions to date that relate to a particular measure.
- **Actions and Progress Indicators** - Action steps and progress indicators are provided in a table following each measure description. Actions identify specific steps that the County will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the Board of Supervisors, and the public to track implementation and monitor overall CAP progress. Specific progress indicators are provided for both 2020 and 2035.

ENERGY MEASURES:

The use of electricity and natural gas within residential, commercial, and industrial buildings generated over 36% of unincorporated Shasta County's communitywide GHG emissions in 2008. The energy measures described on the following pages recommend ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase the use of renewable energy.

Measure BE-1: Existing Buildings

2020 GHG Reduction Potential: 201 MT CO_2e/yr
2035 GHG Reduction Potential: 451 MT CO_2e/yr

Sixty percent of houses in unincorporated Shasta County were built before 1980, and therefore prior to adoption of California's Title 24 energy efficiency requirements. In addition, approximately 95% of housing units and 85% of non-residential square footage that is projected to exist in unincorporated Shasta County in 2020 has already been constructed as of 2008. Energy efficiency retrofits should be targeted to help residents reduce their utility bills and the County's building-related emissions. Utility companies and private contractors can assess a building's efficiency through an energy audit, and identify gaps in the building envelope through which heating and cooling escape. Audits can also help homeowners and building owners to prioritize retrofit investments to maximize their financial returns.

In the past, the County has advertised the PG&E energy efficiency audit program and weatherization assistance and rebate programs to its residents and business owners. PG&E currently offers a variety of rebates for installing energy-efficient features, including:

- cool roofs,
- attic and wall insulation,
- cooling and heating equipment, and
- swimming pool pumps.

PG&E also offers rebates on whole-house packages for homeowners that wish to address energy efficiency holistically.

The Energy Upgrade California website (www.energyupgradeca.org) is another resource to identify rebates and incentive programs throughout the state. There are currently over 50 programs available to Shasta County residents, which are funded by utility companies and state agencies. Incentives and rebates are available to help home and business owners improve efficiency in the following areas:

- air and duct sealing;
- attic, wall, and hot water pipe insulation;
- water-efficient fixtures (e.g., low-flow shower heads);
- HVAC upgrades (e.g., air conditioners, whole house fans, ducted evaporative cooling systems, ceiling fans);
- cool roofs;
- hot water heaters/blankets;
- indoor lighting; and
- ENERGY STAR appliances (e.g., dishwashers, refrigerators, freezers).

The County will develop a comprehensive public outreach campaign to provide information on the benefits of energy efficiency improvements. The outreach campaign should present the simple cost payback calculations associated with common efficiency upgrades, explain how building energy audits can help identify cost-effective upgrade options, and provide information on existing rebates and incentive programs.

ACTION		RESPONSIBILITY
Short-Term		
A	Continue to promote PG&E incentives and energy conservation programs for older homes.	Resource Management
B	Develop comprehensive public outreach campaign promoting energy-efficiency improvements.	Resource Management
PROGRESS INDICATORS		**YEAR**
1	2% of existing residential buildings implement energy efficiency retrofits and 10% of existing non-residential buildings implement energy efficiency retrofits	2020
2	4.5% of existing residential buildings implement energy efficiency retrofits and 22.5% of existing non-residential buildings implement energy efficiency retrofits	2035

Measure BE-2: New Construction

2020 GHG Reduction Potential: Contained within Title-24 in Statewide
2035 GHG Reduction Potential: Contained within Title-24 in Statewide

Energy consumption represents the second largest emissions sector in unincorporated Shasta County's emissions inventory. Constructing new buildings and retrofitting existing buildings in a way that reduces their energy use, will result in fewer emissions. Energy efficient building design and construction can help reduce heating needs in the winter and cooling needs in the summer.

The 2010 CalGreen Building Code (CalGreen) sets guidance for higher building performance standards. CalGreen offers two voluntary compliance pathways to achieve 15% and 30% energy efficiency above the State's 2008 Title 24 Energy Code efficiency requirements. Contingent upon funding availability, the County will develop priority permitting to new residential projects that demonstrate 15% higher energy efficency than Title 24 requirements. These efforts will serve to increase energy efficiency of new residential buildings and would help to lower homeowners utility bills.

Additional energy savings are anticipated to be created through the 2013 update of the State's Title 24 standards. All new construction developed between 2010 and 2015 has been, or will be, required to meet the 2008 Title-24 requirements. All new construction developed between 2015 and 2020 will be required to comply with the updated 2013 Title 24 requirements that the California Energy Commission estimates will be 20-25% more energy efficient than the 2008 standards. The County anticipates that more than 50% of all new construction in the County will be subject to the 2013 Title 24 standards. The unincorporated Shasta County CAP includes reductions associated with the 2008 and 2013 Title 24 standards with the statewide reductions (see appendix B for details). Further increases in Title 24 standards are anticipated after 2017 but are too speculative at this point in time to quantify.

Because the State develops the Title 24 standards for each code period with the goal of balancing energy efficiency and cost-effectiveness, the County believes it is not prudent to require efficiency at a level higher than the State's standard. The County will not adopt an efficiency standard more stringent than the State's code.

ACTION		RESPONSIBILITY
Short-Term		
A	Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.	Building
PROGRESS INDICATORS		**YEAR**
1	50% of new residential (i.e., single-family and multi-family) and non-residential construction achieves 25% reduction in energy use above 2008 Title-24	2020
2	75% of new residential (i.e., single-family and multi-family) and non-residential construction achieves 25% reduction in energy use above 2008 Title-24	2035

Measure BE-3: Commercial Indoor Lighting

2020 GHG Reduction Potential: 24 MT CO_2e/yr
2035 GHG Reduction Potential: 65 MT CO_2e/yr

There is approximately 700,000 square feet of non-residential building space in unincorporated Shasta County. Conventional commercial lighting used to illuminate these buildings, including T12 fluorescent bulbs, consumes more energy than new T8 lights, light-emitting diodes (LED), and other efficient lighting technologies. Retrofitting existing commercial interior lighting is a relatively easy upgrade to make, and rebate programs are available to reduce the already short simple-payback period. PG&E's lighting upgrade program includes rebates for fixtures, lamps, accent/directional lighting, controls and occupancy sensors, and signage.

The County will work with non-residential developers during the building permit phase to ensure that applicable rebate programs are used to their greatest effect. The County will also provide targeted outreach and technical assistance to owners/mangers of large (i.e., > 50,000 sqft), non-residential buildings to encourage participation in PG&E's lighting upgrade program. The County's outreach will include a description of the short payback period associated with lighting upgrade improvements.

ACTION		RESPONSIBILITY
Short-Term		
A	Discuss applicable rebates and incentive programs with building developers during the building permit phase	Building
B	Provided targeted outreach to building owners/managers of large non-residential buildings	Resource Management
PROGRESS INDICATORS		**YEAR**
1	10% of non-residential buildings reduce indoor lighting load by 40%	2020
2	22.5% of non-residential buildings reduce indoor lighting load by 40%	2035

Measure BE-4: Energy-Efficient Appliances

2020 GHG Reduction Potential: 1,443 MT CO_2e/yr
2035 GHG Reduction Potential: 9,459 MT CO_2e/yr

As building shells and systems become increasingly efficient, addressing energy consumption from appliances and electronics will become more important in reducing building energy use and residents' utility bills. Installing ENERGY STAR appliances is one way to address this type of energy use. The ENERGY STAR rating is an internationally recognized standard for energy-efficient consumer products. According to the EPA, devices that have an ENERGY STAR certification, such as dishwashers, refrigerators, and washing machines, generally use 20% to 30% less energy than required by federal standards. In 2006, approximately 30% of refrigerators, 40% of clothes washers, and 90% of dishwashers sold nationwide were ENERGY STAR-certified appliances. PG&E offers

rebates to its customers for the purchase of qualifying energy-efficient appliances.

The County will partner with PG&E and other organizations to promote existing financial incentives and rebates for energy-efficient appliance upgrades and replacements in both new and existing residential units. Successful implementation of this measure requires a broad public outreach campaign to reach all segments of the community. The County will identify community events at which it can staff an informational table to advertise energy-efficiency rebates and incentives, including farmers' markets, Burney Basin Days, the Strawberry festival, and the Shasta County Fair. The County will also work with PG&E to include informational inserts in utility bills that advertise PG&E's existing rebate programs and the simple cost payback associated with replacing inefficient appliances. Targeted outreach should also be provided to the building community at the building permit phase, and to homebuyers and renters through a partnership with local realtors and property managers.

	ACTION	RESPONSIBILITY
	Short-Term	
A	Collaborate with PG&E to promote existing financial incentives programs to encourage voluntary replacement of inefficient appliances with new ENERGY STAR appliances	Resource Management
B	Advertise energy-efficient appliance rebates at community events	Resource Management
	PROGRESS INDICATORS	**YEAR**
1	New homes install ENERGY STAR appliances at the following rates: 40% refrigerators, 40% clothes washers, and 70% dishwashers	2020
2	Existing homes replace ENERGY STAR appliances at the following rates: 20% refrigerators, 20% clothes washers, and 20% dishwashers	2020
3	New homes install ENERGY STAR appliances at the following rates: 90% refrigerators, 90% clothes washers, and 90% dishwashers	2035
4	Existing homes replace ENERGY STAR appliances at the following rates: 90% refrigerators, 90% clothes washers, and 90% dishwashers	2035

Measure BE-5: Smart Grid Integration

2020 GHG Reduction Potential: 1,214 MT CO_2e/yr
2035 GHG Reduction Potential: 2,731 MT CO_2e/yr

The smart grid is an emerging energy management system, which combines information technology with renewable energy to improve how electricity is generated, delivered, and consumed. The smart grid will reduce energy demand, improve integration of distributed energy production (e.g., rooftop solar panels), and increase electricity transmission and distribution efficiency. These changes will help residents and businesses save energy, and can reduce GHG emissions associated with energy production. The first step in saving energy from the smart grid is to install smart meters, which allow customers to track their home or businesses' energy use throughout the day. In 2011, PG&E began installing smart meters in homes and businesses throughout Shasta County. The value of the smart grid does not end at the meter, however; its full value is realized when it extends into technologies used in homes and businesses. For example, smart appliances can be

programmed to operate during off-peak hours when electricity prices are cheaper.

The County will encourage voluntary adoption of smart grid technology in new and existing construction, promoting the use of smart appliances in homes and businesses. The County will develop an outreach campaign highlighting the benefits of smart grid integration that can occur following smart meter installation. The outreach campaign should describe how energy management systems work inside a building, including internet-based displays (e.g., smart phone applications) that show how much energy is being used and smart appliances that can defer discretionary electricity use to off-peak hours.

ACTION		RESPONSIBILITY
Short-Term		
A	Develop an outreach program with PG&E that informs property owners and businesses about smart grid and smart appliance technologies, as well as energy conservation opportunities using smart meter technology	Resource Management

PROGRESS INDICATORS		YEAR
1	10% of existing residential and commercial customers adopt smart-grid technology	2020
2	30% of new residential and commercial customers adopt smart-grid technology	2020
3	22.5% of existing residential and commercial customers adopt smart-grid technology	2035
4	67.5% of new residential and commercial customers adopt smart-grid technology	2035

Measure BE-6: Solar Water Heaters

2020 GHG Reduction Potential: 886 MT CO_2e/yr
2035 GHG Reduction Potential: 2,336 MT CO_2e/yr

Shasta County's location and geography result in a relatively high solar insolation rating (comparable to southern cities, such as Orlando, Fl and New Orleans, LA), which makes it an excellent candidate for effective adoption of solar technologies. Solar water heaters (SWH) systems can reduce the amount of natural gas or electricity used to heat water in conventional systems and thereby reduces energy-related GHG emissions. However, the high capital cost of SWH systems can pose a financial burden to building owners. A number of financing options can reduce up-front costs, such as on-bill financing, low-interest loans, and rebates under the California Solar Initiative (CSI). Through the CSI-Thermal Program, single-family homeowners are eligible for SWH rebates of up to $1,875. Non-residential customers who install certified SWH systems can qualify for incentives of up to $500,000 to offset capital costs. Incentive levels will decline in four stages as the solar thermal market grows. Actual incentive payments will be determined by the thermal output of the system.

The County will actively promote and facilitate the installation of SWH systems on buildings and for private swimming pools through an outreach program describing currently available CSI-Thermal Program rebates. The County will collaborate with PG&E and other non-profit organizations to identify additional local, State, or national financing options. The County will also provide permit streamlining and fee reductions related to the installation of SWH systems as a further incentive.

ACTION		RESPONSIBILITY
Short-Term		
A	Work with PG&E and California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential and commercial buildings	Resource Management
B	Encourage the use of California Solar Initiative, US EPA, PG&E, and other rebates for solar hot water heaters	Resource Management
C	Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation	Building
D	Reduce or waive fees associated with installation of solar water heaters	Building
PROGRESS INDICATORS		**YEAR**
1	5% each of single-family residential buildings, multi-family residential buildings, and non-residential buildings install a solar hot water system	2020
2	11.3% each of single-family residential buildings, multi-family residential buildings, and non-residential buildings install a solar hot water system	2035

Measure BE-7: Solar Photovoltaic Systems

2020 GHG Reduction Potential: 6,315 MT CO_2e/yr
2035 GHG Reduction Potential: 15,400 MT CO_2e/yr

As mentioned in Measure BE-6, Shasta County is a good candidate for solar technologies based on its relatively high solar insolation level. Installation of residential solar photovoltaic (PV) systems allows homeowners to take advantage of cost-saving renewable energy. In addition to residential rooftops, commercial and industrial rooftops tend to have large, flat roofs that are often well-suited for larger PV systems. Parking lots also provide excellent opportunities for additional solar energy generation. However, numerous barriers may prevent widespread adoption of solar PV technology: County regulations, up-front costs, misinformation or lack of information.

Various options are available to assist residents and businesses in overcoming the financial burdens associated with PV installation, including rebates, incentives, and solar service providers. The California Solar Initiative (www.gosolarcalifornia.org) offers rebates for small PV units of 30kW and less, which are suitable for households and small businesses, as well as rebates for larger systems. Specific rebate programs target existing homes, low-income and affordable multi-family buildings, and low-income and affordable single-family houses. Solar service providers allow residents and businesses to enjoy the price-saving benefits of solar energy with little to no upfront costs by offering solar PV system design, finance, installation, and maintenance to residential and commercial customers. Customers have the option to purchase or lease a PV system or enter into a power purchase agreement (PPA) with a provider, in which they lock in their solar energy rates for the duration of their PPA contract. Customers who lease a system or enter a PPA can do so with no upfront cost; the provider installs, owns, maintains, and insures the PV system for the duration of the contract.

The County will develop a multi-pronged approach to remove barriers to PV installation. The County will review its regulations, ordinances, and codes to identify any barriers to solar project installation. The County will develop a solar outreach campaign that encourages property owners to install PV

systems through streamlined permitting, reduced permitting fees, technical assistance, and information on currently available rebates or incentive programs. The County will also actively encourage residents and business owners to take advantage of cost-saving solar service providers that operate in the area.

ACTION		RESPONSIBILITY
Short-Term		
A	Remove regulatory barriers to installation of PV systems	Building
B	Provide streamlined permitting and reduce permitting fees related to installation of PV systems	Building
C	Develop public outreach campaign that explains benefits of PV systems, highlights available rebates/incentives, explains PPAs and identifies solar service providers in the area	Resource Management
PROGRESS INDICATORS		**YEAR**
1	10% of single-family residential units install a rooftop PV system County government installs 6.5 MW of solar power	2020
2	22.5% of single-family residential units install a rooftop PV system County government installs 15 MW of solar power	2020

WATER MEASURES:

The water sector generated approximately 2% of unincorporated Shasta County's communitywide GHG emissions in 2008, primarily through electric water pump use to supply potable water to residents and businesses. The following water-related measure recommends ways to reduce residential indoor water use through installation of efficient fixtures and appliances.

Measure W-1: Residential Fixture and Fittings Retrofit

2020 GHG Reduction Potential: 94 MT CO_2e/yr
2035 GHG Reduction Potential: 206 MT CO_2e/yr

Sixty percent of houses in unincorporated Shasta County are more than 30 years old, and water fixtures and appliances have improved considerably since these units were built. Replacing plumbing fixtures in older houses can provide water conservation benefits (and electricity savings where private wells are used), which translate into lower utility bills for homeowners. Reducing water demand also results in fewer emissions because less energy is used to pump, treat, deliver, and collect water and wastewater. Common fixture and appliance replacements include toilets, showerheads, faucets, dishwashers, and clothes washers.

The County will provide information to residents during the building permit phase that describes the benefits of installing high-efficiency fixtures, fittings, and appliances. The County will also identify any applicable rebates from utility providers or agencies and provide that information on the Shasta County Water Agencies webpage.

ACTION		RESPONSIBILITY
Short-Term		
A	Develop informational materials that describe benefits of installing high-efficiency water fixtures/appliances	Building
B	Identify water efficiency rebates or incentives applicable to unincorporated Shasta County residents	Resource Management
PROGRESS INDICATORS		**YEAR**
1	5% of residential households install high-efficiency toilets, showerheads, faucets, dishwashers, and clothes washers	2020
2	11.3% of residential households install high-efficiency toilets, showerheads, faucets, dishwashers, and clothes washers	2035

WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 5% of unincorporated Shasta County's communitywide GHG emissions in 2008. The waste-related measures described on the following pages recommend ways to increase diversion of organic wastes and describe the County's implementation of enhanced landfill methane capture systems.

Measure SW-1: Lumber Waste Diversion Ordinance

2020 GHG Reduction Potential: 1,334 MT CO_2e/yr
2035 GHG Reduction Potential: 3,495 MT CO_2e/yr

Construction and demolition waste made up 29% of the statewide waste stream in 2008. However, various construction materials can be salvaged during the demolition process for reuse or recycling, including, concrete, bricks, lumber, metal, and drywall. Diverting materials from the waste stream increases the longevity of landfills, and in the case of organic materials, reduces landfill-related methane emissions.

The County will adopt a construction and demolition lumber waste diversion ordinance that applies to new construction and renovations. The ordinance will require 75% of lumber waste to be diverted from the waste stream. CalRecycle provides guidance on developing construction and demolition waste diversion ordinance language to facilitate implementation.

ACTION		RESPONSIBILITY
Short-Term		
A	Adopt 75% lumber diversion ordinance applicable to residential and commercial construction and renovation projects	Building
PROGRESS INDICATORS		**YEAR**
1	100% of residential and commercial projects participate in 75% lumber waste diversion	2020
2	100% of residential and commercial projects participate in 75% lumber waste diversion	2035

Measure SW-2: Methane Recovery

2020 GHG Reduction Potential: 16,360 MT CO_2e/yr
2035 GHG Reduction Potential: 20,051 MT CO_2e/yr

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of AB 32. Per the regulation, methane capture facilities have been required at all municipal solid waste landfills since June 2010. Two landfills are used in Shasta County to dispose of waste from unincorporated County residents: the West Central Landfill and the Anderson Landfill. The West Central Landfill is currently an uncontrolled municipal solid waste landfill, meaning there is no methane capture infrastructure in place. However, the County is in the process of constructing a gas control system that would capture landfill-generated methane and direct it to a flare where it would be burned off, dramatically reducing the global warming potential of the gas. In the future, this system may be upgraded to a landfill gas-to-energy system under which an operator could construct a power plant to capture the landfill methane and burn it to generate electricity. The Anderson Landfill currently has a methane capture system in place with no plans for system upgrades.

The County will complete installation of the methane capture facility at the West Central Landfill. The County will also continue to explore the feasibility of installing a landfill gas-to-energy system at the landfill through a partnership with an independent energy provider.

ACTION		RESPONSIBILITY
Short-Term		
A	Complete installation of methane capture facilities at West Central Landfill	Public Works
B	Evaluate future proposals for construction of landfill energy-to-gas system at West Central Landfill	Public Works
PROGRESS INDICATORS		**YEAR**
1	Methane recovery efficiency at West Central Landfill improved from 0% to 75%	2020
2	Methane recovery efficiency at West Central Landfill continued at 75%	2035

TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 43% of unincorporated Shasta County's communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the County's efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.

Measure T-1: Bicycle Lane Expansion

2020 GHG Reduction Potential: 127 MT CO_2e/yr
2035 GHG Reduction Potential: 354 MT CO_2e/yr

Unincorporated Shasta County currently has approximately 3.0 miles of bicycle lanes. The *Shasta County 2010 Bicycle Transportation Plan* (BTP) proposes an additional 88.0 miles of bicycle lanes to connect major employers and points of interest within the County, including Shasta College, schools, and community centers. The BTP also encourages the provision of end-of-trip facilities, such as bicycle lockers, showers, and changing facilities, at public and private employers. It also encourages bicycle racks to be installed at all County schools, major employers, and within the County's community centers to facilitate bicycle commuting.

The County will identify and pursue funding sources to implement the BTP. The County will construct the proposed 86.0 miles of bike paths as funding becomes available with priority given to projects that connect major activity centers (e.g., schools, large employers, community centers) with residential neighborhoods. The County will also encourage non-residential developers to incorporate end-of-trip facilities in projects that include employment centers.

ACTION	RESPONSIBILITY
Short-Term	
A Pursue funding to implement Bicycle Transportation Plan; construct proposed bicycle paths	Resource Management Public Works Department SRTA
B Discuss benefits of providing end-of-trip facilities at large employment centers with project developers	Planning; Building
PROGRESS INDICATORS	**YEAR**
1 43 miles of bicycle paths constructed	2020
2 97 miles of bicycle paths constructed	2035

Measure T-2: Commute Trip Reduction

2020 GHG Reduction Potential: 70 MT CO_2e/yr
2035 GHG Reduction Potential: 116 MT CO_2e/yr

Approximately 92% of unincorporated Shasta County residents commute to work by automobile. The remaining 8% commute by a variety of methods, including public transportation, carpooling, bicycling, walking, and telecommuting. Social media websites and other internet-based technologies can facilitate ridesharing by connecting interested drivers and passengers. Strategic facility improvements at important public transportation nodes can also increase ridership by removing some of the perceived barriers (e.g., unpredictable arrival/departure times, unsafe/unmarked bus stops). Increasing carpooling and public transit use will reduce the total vehicle miles traveled by

County residents, resulting in fewer GHG emissions.

The County will work with SRTA and other agencies to facilitate ridesharing opportunities, including carpooling and vanpooling. Specifically, the County will work with partners to develop ride-matching systems to use current technologies (e.g., cell phone-enabled ride-match applications), and develop a ride-match social networking website and online electronic payment options. The County and RTPA will also evaluate the need for additional park-and-ride lots, and will pursue funding for bus stop improvements, including shelters, seating, and electronic signage.

ACTION		RESPONSIBILITY
Short-Term		
A	Develop a ride-matching website	Resource Management SRTA
B	Identify transit stops in high-activity areas that would benefit from additional enhancements (e.g., shelter, seating, electronic arrival/departure information)	SRTA
C	Pursue funding for transit stop improvements	SRTA
PROGRESS INDICATORS		**YEAR**
1	5% of employees in unincorporated Shasta County commute via carpool or public transit	2020
2	5% of employees in unincorporated Shasta County commute via carpool or public transit	2035

CARBON SEQUESTRATION MEASURES:

As trees grow they capture and store atmospheric carbon within their trunks, branches, and roots. By planting new trees, the County can offset a portion of the community's GHG emissions. The following measure describes the County's efforts to expand its urban forest.

Measure GI-1: Urban Forest

2020 GHG Reduction Potential: 30 MT CO_2e/yr
2035 GHG Reduction Potential: 70 MT CO_2e/yr

The urban forest encompasses all of the trees in the County, from street trees and private landscapes to County parks and natural, open spaces. A healthy urban forest can shade buildings and streets, reducing the urban heat island effect and reducing the need for building cooling. Urban trees also improve water and air quality, increase wildlife habitat, and contribute to neighborhood beautification.

Trees can help the County achieve its GHG reduction goal by reducing building energy-related emissions, as well as through carbon sequestration. The capacity of a tree to reduce GHG emissions is dependent on its age and species. As trees mature, their canopies increase in size and provide higher levels of shade and greater levels of building cooling in hot weather. Trees with larger canopies and dense foliage provide more shade than other species. Large, deciduous species are ideal for reducing building energy as they provide shade in summer, but allow winter sunlight into buildings for passive solar gain in cooler weather. Additionally, trees gain carbon-capturing biomass

in their trunks and roots as they absorb carbon from the air to grow. The California Center for Sustainable Energy created the Advice and Technical Assistance Center (ATAC) for Urban Forestry, which has a full catalog of educational information about tree planting, to assist residents and businesses in planting trees around their buildings.

The County will leverage existing information on the benefits of shade trees, including information provided on the PG&E and ATAC websites, to encourage residents to voluntarily plant shade trees on their property.

ACTION		RESPONSIBILITY
Short-Term		
A	Work with PG&E to advertise the benefits of planting shade trees around buildings and parking lots	Resource Management
PROGRESS INDICATORS		**YEAR**
1	400 shade trees are planted.	2020
2	900 shade trees are planted.	2035

IMPLEMENTATION AND MONITORING

This section describes how the County will implement the emission reduction measures and actions contained in the CAP. The section contains the following three subsections:

- **Measure Implementation** - Describes how County staff will implement CAP measures and their related actions, and the role of the progress indicators and other guidance provided within the measure tables.
- **Program Evaluation and Evolution -** Discusses the need to evaluate, update, and amend the CAP over time, in order to ensure that the program remains effective and current.
- **Relationship to the California Environmental Quality Act**- Describes the relationship between the CAP and the California Environmental Quality Act (CEQA), and establishes criteria for County staff to use when determining if a proposed project is consistent with the document.

MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure contains a table that identifies the specific actions the County will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that enable County staff, the Board of Supervisors, and the public to track measure implementation and monitor overall CAP progress.

The tables provide both interim (2020) and final (2035) progress indicators where possible. Interim progress indicators are especially important, as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the County departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships

will need to be established. The County would also need to assess its progress towards measure implementation.

PROGRAM EVALUATION AND EVOLUTION

The CAP represents the County's best initial attempt to create an organized, communitywide response to the threat of climate change at the time of preparation. Staff will need to evaluate the program's performance over time and be ready to alter or amend the plan if it is not achieving the reduction targets.

Program Evaluation

Two types of performance evaluation are important: (A) evaluation of the community's overall ability to reduce GHG emissions as a whole and (B) evaluation of the performance of individual CAP measures. Communitywide emission inventories will provide the best indication of CAP effectiveness. It will be important to reconcile actual growth in the County versus the growth projected when the CAP was developed. Conducting these inventories periodically will enable direct comparison to the 2008 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction targets. The County will coordinate communitywide inventories in 2015, 2020, 2025, 2030, and 2035, or in association with 5-year General Plan updates, to assess the level of GHG reduction goal attainment.

While communitywide inventories provide information about overall GHG reductions, it will also be important to understand the effectiveness of each measure. Evaluation of the emissions reduction capacity of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The County can reinforce successful measures and reevaluate or replace under-performing ones. Evaluating measure performance will require data regarding actual community participation rates and measurement of GHG reduction capacity.

The County will coordinate measure evaluation on the same schedule as the communitywide inventories, and summarize the progress towards meeting the GHG reduction goal in a report that describes:

- Achievement of progress indicators
- Participation rates (where applicable)
- Estimated annual GHG reductions in 2020
- Remaining barriers to implementation

Importantly, a progress report on the CAP action items will also be provided to decision-makers on an annual basis. The progress report will include a brief assessment on the progress and implementation of individual CAP measures, including how new projects have incorporated relevant measures. The progress report will allow for gaps and new opportunities to be identified. It also will allow for additional measures to be added to the CAP.

It will be necessary to institute an annual monitoring program that tracks the performance of individual measures. The data collection and processing necessary to establish performance levels would be conducted by the responsible parties identified for each measure (as noted in the measure tables).

Program Evolution

To remain relevant, the County must be prepared to adapt and transform the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing will be available, and State and federal legislation will change. It is also possible that communitywide inventories will indicate

that the community is not achieving its adopted target. As part of the evaluations identified above, the County will assess the implications of new scientific findings and technology, explore new opportunities for GHG reduction, respond to changes in climate policy, and incorporate these changes in future updates to the CAP to ensure an effective and efficient program.

RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA Guidelines, Section 15183.5 describes the requirements for an emissions reduction plan to be able to provide tiering and streamlining benefits to future development projects. Section 15183.5(b)(1)(D) specifically states that the plan must contain measures, that if implemented on a project-by-project basis, would collectively achieve the plan's established emissions reduction target. This guidance essentially means that each future project seeking to use CEQA tiering will need to demonstrate compliance with the CAP.

Project Consistency with the CAP

The CAP identifies both mandatory and voluntary emission reduction measures that would apply to different types of future proposed projects.

Mandatory Measures

For the following mandatory measure, the CAP recommends a change to the County's codes and ordinances that would result in GHG reductions.

- **Measure SW-1** – Lumber Waste Diversion Ordinance

All projects would be required to comply with this ordinance, making this measure binding and enforceable on new projects, within the meaning established by State CEQA Guidelines Section 15183.5(b)(2). The proposed project would describe how this measure would be integrated into the development in its application materials and environmental documentation.

Voluntary Measures

The remaining measures are essentially voluntary, relying on assumed levels of community participation to create communitywide emission reductions. These measures will be tracked to ensure participatory rates are reached and that the voluntary measures are being adequately applied to new and existing projects. If not, then additional, more aggressive actions will be necessary to correct any short-fall.