



Chapter 4 - City of Shasta Lake

PURPOSE

This chapter serves as the Climate Action Plan (CAP) for the City of Shasta Lake. The City 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.
- It must be adopted in a public process following environmental review (certification of an Environmental Impact Report or adoption of a negative declaration, mitigated negative declaration or other environmental document);

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

GREENHOUSE GAS EMISSION INVENTORY AND FORECASTS

The following section provides a summary of the City of Shasta Lake's communitywide 2008 baseline GHG emissions inventory, the business-as-usual emissions forecasts, and the adjusted business-as-usual 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 City's CAP. Using data collected from City departments, utilities, and other relevant agencies and locally-specific emissions factors, the inventory provides an accurate assessment of the sources of GHG gas emissions generated within the City of Shasta Lake or as a direct result of city operations (even if outside city limits) in the baseline year. This data allows the City to identify appropriate GHG reduction targets and strategies.

To ensure a comprehensive and complete GHG inventory, the City developed a *Full Inventory* that contains emissions from all sectors including building energy (electricity and natural gas), water (water demand and wastewater), solid waste, transportation, off-road vehicles, recreation, and stationary sources (industrial). Due to a lack of jurisdictional control over the stationary-source sector, emissions from this sector are excluded from the *Jurisdictional Inventory*. Examples of permitted stationary-source emissions that are not under the control of the City include process energy-related emissions 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 215,988 metric tons of carbon dioxide equivalent emissions (MT CO₂e). As shown in Figure 4.1 and Table 4.1, energy production and consumption generated the largest portion of emissions at 82,943 MT CO₂e (38% of the total emissions). Stationary sources, such as Sierra Pacific Industries and Knauf Insulation, generated the second highest amount of emissions in the City at 72,038 MT CO₂e (33% of the total emissions), followed by transportation emissions at 48,106 MT CO₂e (22% of the total emissions). The water and off-road/recreation sectors comprise the remaining 7% of the emissions inventory.

Jurisdictional Inventory

With the removal of the stationary source sector emissions, the community's baseline jurisdictional inventory lowers to 143,950 MT CO₂e in 2008. As shown in Figure 4.2, energy production and consumption generated 58% of total emissions, and transportation generated 33% of total emissions. The off-road/recreation, solid waste, and water sectors each contributed approximately 3%.

Figure 4.1 – 2008 Total Greenhouse Gas Emissions Inventory by Sector

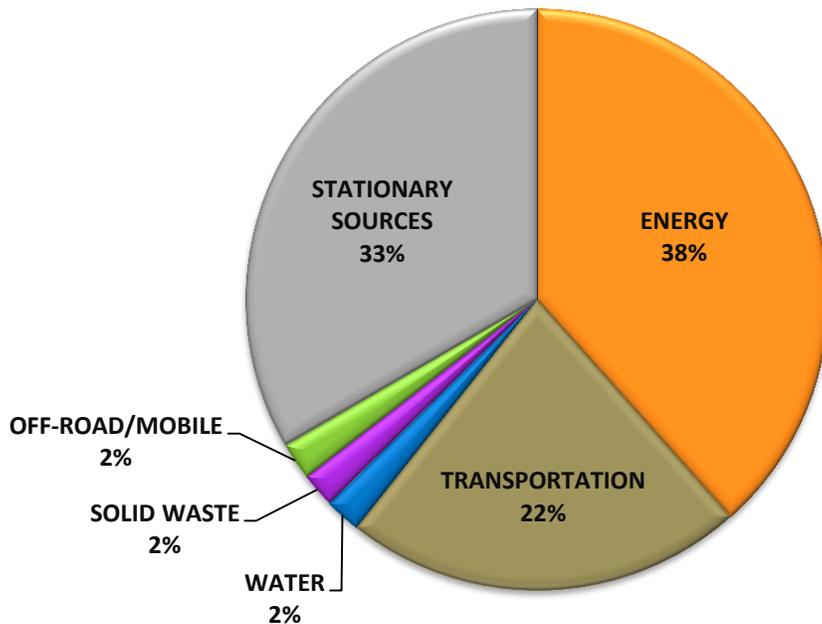


Figure 4.2 – 2008 Jurisdictional Greenhouse Gas Emissions Inventory by Sector

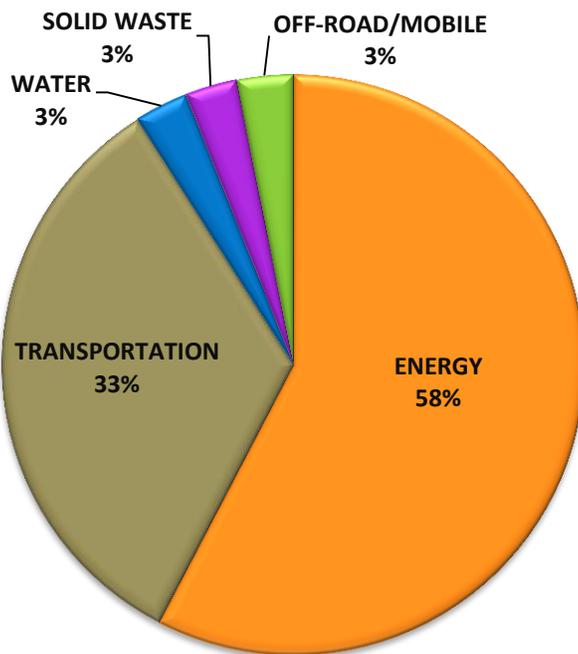


Table 4.1 – Greenhouse Gas Emissions Inventory and Business-as-Usual Forecasts: 2008, 2020, 2035, and 2050

Sector	2008 (MT CO ₂ e/yr)	2020 (MT CO ₂ e/yr)	% Change from 2008	2035 (MT CO ₂ e/yr)	% Change from 2008	2050 (MT CO ₂ e/yr)	% Change from 2008
Energy	82,943	90,912	10%	107,899	30%	127,491	54%
Transportation	48,106	56,608	18%	78,196	63%	104,443	117%
Solid Waste	4,139	4,658	13%	5,369	30%	6,021	45%
Water	4,273	4,808	13%	5,543	30%	6,216	45%
Off-Road and Recreation	4,489	5,051	13%	5,822	30%	6,530	45%
Stationary Sources (Non- Jurisdictional)	72,038	72,038	0%	72,038	0%	72,038	0%
TOTAL INVENTORY	215,988	234,075	8%	274,867	27%	322,739	49%
JURISDICTIONAL INVENTORY	143,950	162,037	13%	202,829	41%	250,700	74%

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 City has prepared GHG forecasts for 2020, 2035, and 2050 horizon years.

The City’s emissions are forecasted to be 162,037 MT CO₂e in 2020, 202,829 MT CO₂e in 2035, and 250,700 MT CO₂e in 2050, representing growth of 13%, 41%, and 74%, respectively, from the 2008 baseline emissions. Table 4.1 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 City’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., solid 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 City will reevaluate the forecasts throughout the CAP implementation process.

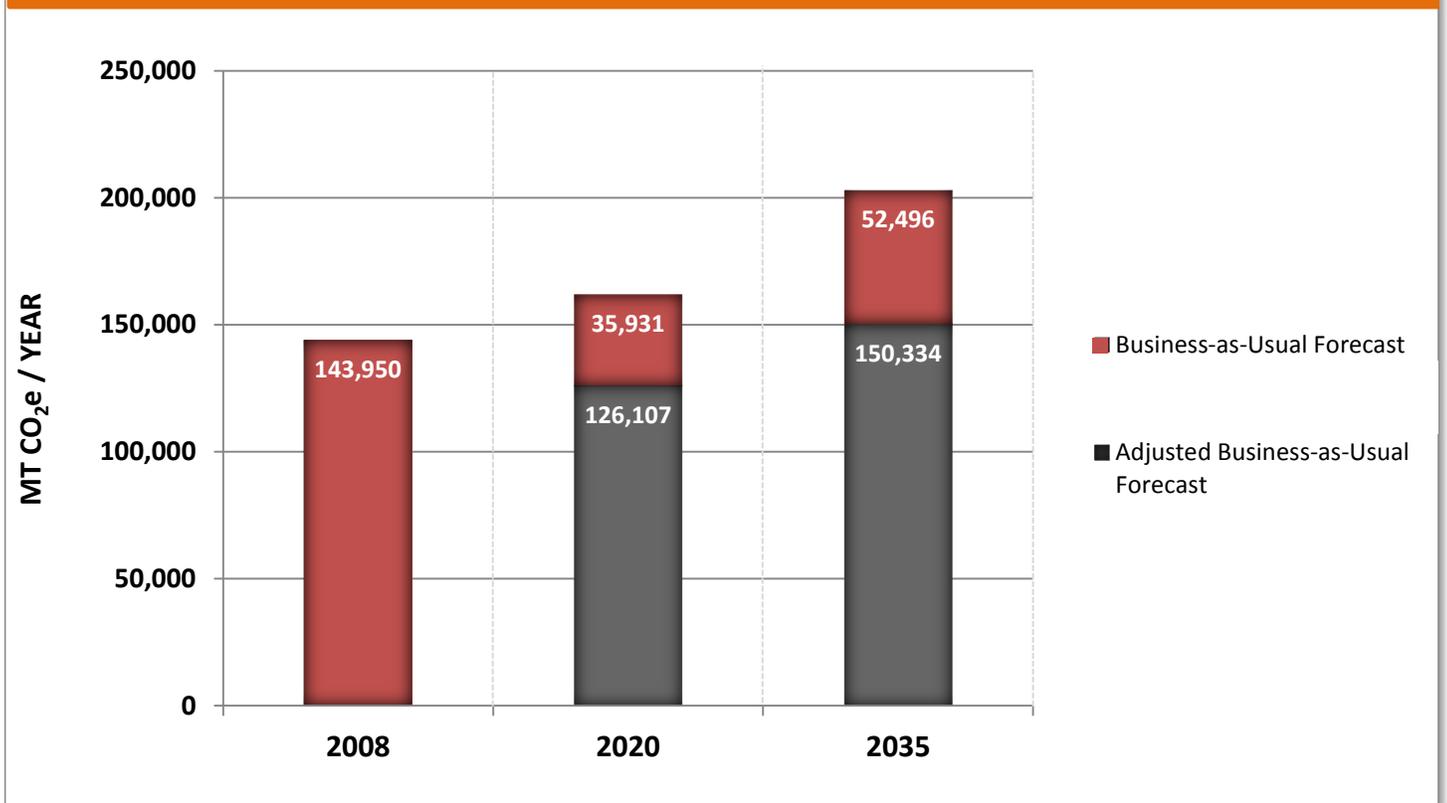
ADJUSTED BUSINESS –AS-USUAL GREENHOUSE GAS EMISSIONS FORECASTS

Table 4.2 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). California law also requires all utilities to obtain 33% of their electricity from renewable energy sources by 2020. In 2008, about 12% of the Shasta Lake Electric Utility’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 Shasta Lake will make it easier for the community to achieve 2020 and 2035 emission reduction goals. As shown in Table 4.2 and Figure 4.3, with implementation of State and federal actions, communitywide emissions would be 126,107 MT CO₂e/yr in 2020 and 150,334 MT CO₂e/year in 2035.

**Table 4.2 – Emission Reductions from State and Federal Actions
2020 and 2035**

State or Federal Action	2020 Reduction (MT CO₂e/year)	2035 Reduction (MT CO₂e/year)
Passenger vehicle and light-duty truck fuel efficiency standards	11,931	25,083
Low Carbon fuel standard	5,462	6,173
Non-Pavley Passenger Vehicle Efficiency Programs	1,429	1,954
Medium- and heavy-duty vehicle efficiency improvement program	347	489
2008 and 2013 California Title-24 standards	200	462
Renewable portfolio standard (33% by 2020)	16,562	18,335
Total	35,931	52,496

FIGURE 4.3 - BUSINESS-AS-USUAL & ADJUSTED BUSINESS-AS-USUAL EMISSIONS FORECASTS

GREENHOUSE GAS EMISSION REDUCTION TARGETS

The City has selected emission reduction targets that are both ambitious and practical. The targets will allow the City 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. Shasta Lake's GHG reduction targets are as follows:

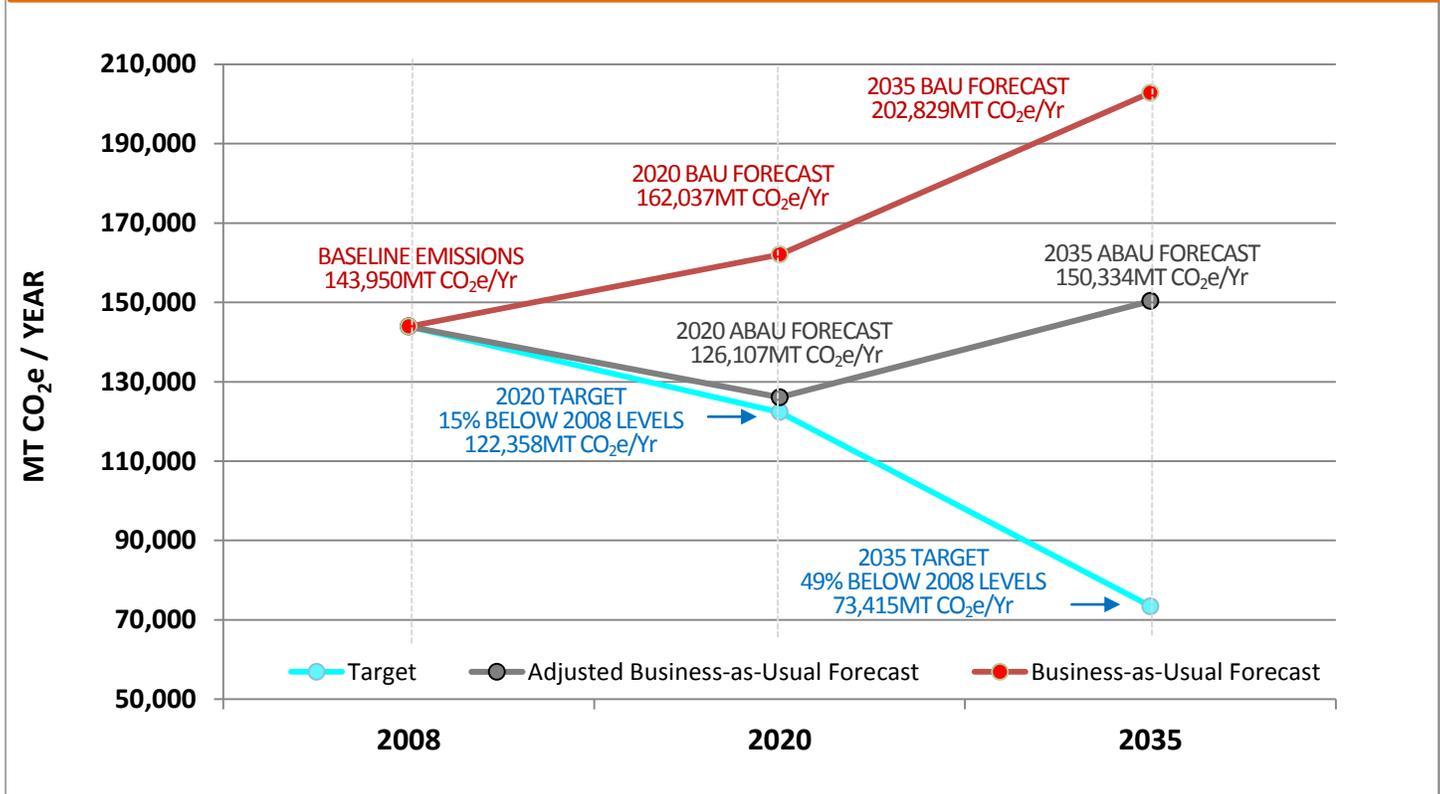
- Reduce community emissions to 15% below 2008 levels by 2020 (122,358 MT CO₂e/yr)
- Reduce community emissions to 49% below 2008 levels by 2035 (73,415 MT CO₂e/yr)
- Reduce community emissions to 83% below 2008 levels by 2050 (24,472 MT CO₂e/yr)

The California Global Solutions Warming Act (AB 32) requires the State to reduce statewide GHG emissions to 1990 levels by 2020. The City 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 City 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 City 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 D.

This CAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. While the City 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 City has chosen not to focus on the 2050 reduction target at this time. The City will regularly re-evaluate its long-term GHG reduction efforts to reflect future conditions and adjust emission reduction measures accordingly.

FIGURE 4.4 - GREENHOUSE GAS REDUCTION TARGETS 2020 & 2035



GREENHOUSE GAS EMISSION REDUCTION MEASURES

To meet its adopted emissions reduction targets, the City will implement policies, programs, and other projects related to energy, solid 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 City will use to implement the local actions.

SUMMARY OF REDUCTIONS

Table 4.3 describes the emissions reduction potential of the City's adopted CAP measures. In 2020, local actions are anticipated to reduce approximately 4,962 MT CO₂e/yr. The solid waste-related measures are expected to provide the largest portion, 54%, of the local reductions. The energy-related measures will provide around 29%, followed by transportation (7%), water (6%), and carbon sequestration (4%). Table 4.4 and Figure 4.5 illustrate that together the local and state actions are expected to reduce communitywide emissions to approximately 15.8% below 2008 baseline emissions levels, surpassing the adopted 2020 target (15% below 2008 levels) by 1,213 MT CO₂e/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 9,148 MT CO₂e/yr. The source of reductions is very similar to those in 2020, with solid waste and energy-related measures contributing the two highest proportions. Local and state actions are expected to reduce communitywide emissions to approximately 1.9% below 2008 baseline emissions levels, a level that falls short of the City's adopted 2035 target (49% below 2008 levels). The City anticipates that new technologies and State or federal policies will be developed and will assist the community achieve this longer-term goal.

Table 4.3 – Quantified Greenhouse Gas Reductions

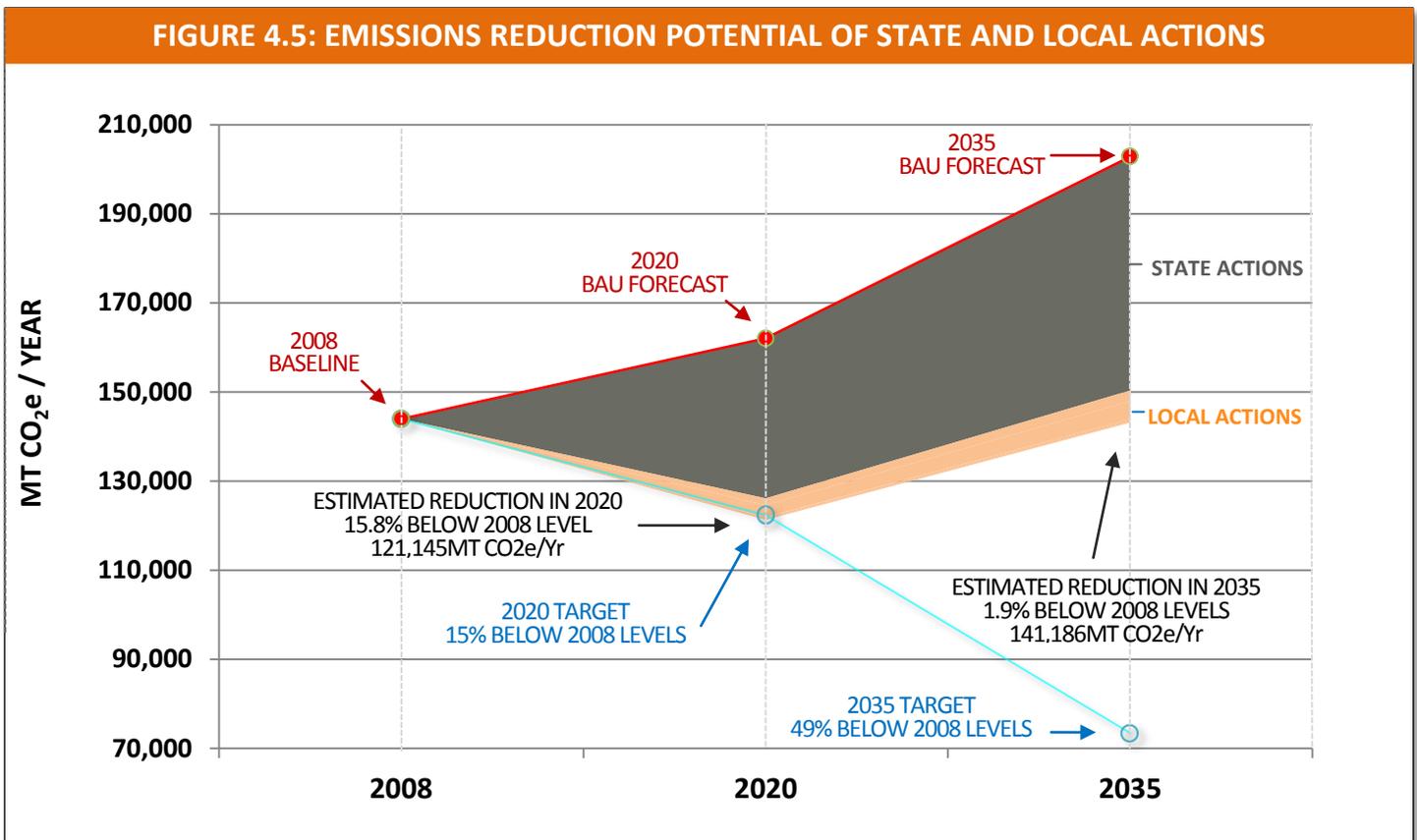
Sectors and Measures		2020 (MT CO ₂ e/yr)	2035 (MT CO ₂ e/yr)
Building Energy			
BE-1	Existing Buildings	25	56
BE-2	New Construction	0	0
BE-3	Commercial Lighting	137	236
BE-4	Efficient Appliances	173	625
BE-5	Solar Water Heaters	254	668
BE-6	Solar Photovoltaic Systems	867	2007
Subtotal		1,455	3,591
Water			
W-1	Water Conservation	314	355
Subtotal		314	355
Solid Waste			
SW-1	Enhanced Organic Waste Diversion	118	312
SW-2	Methane Recovery	2,551	3,207
Subtotal		2,669	3,519
Transportation			
T-1	Mixed-Use Development	290	1,093
T-2	Bicycle Lane Expansion	14	54
T-3	Pedestrian Environment Enhancements	31	97
Subtotal		335	1,243
Carbon Sequestration			
CS-1	Urban Forestry	190	440
Subtotal		190	440
TOTAL LOCAL ACTION REDUCTIONS		4,962	9,148

Table 4.4 - Reduction Potential of City’s CAP Measures

	2008	2020			2035		
	Baseline	BAU	ABUA	ABUA + Local CAP Measures	BAU	ABUA	ABUA + Local CAP Measures
GHG Emissions (MT CO₂e/Yr)	143,950	162,037	126,107	121,145	202,829	150,334	141,186
Change from Baseline	NA	12.6%	-12.4%	-15.8%	40.9%	4.4%	-1.9%
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 4.5 demonstrates the relative contribution of State and the City’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 4.5: EMISSIONS REDUCTION POTENTIAL OF STATE AND LOCAL ACTIONS



REDUCTION MEASURES

The CAP measures define the programs, policies, and projects that the City will undertake to accomplish its emission reduction objectives. Within this section, the measures are organized into four categories including: energy, solid waste, transportation, and carbon sequestration. Each category begins with an introduction followed by the pages that describe the component measures. Appendix D includes estimated costs for measure implementation.

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 CO₂e/yr. All measures have a quantifiable GHG reduction potential.
- **Description** - Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide guidance that will be used in program implementation or highlight the City'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 City will take to implement the measure. The table also identifies responsible departments. Progress indicators enable staff, the City Council, 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 58% of Shasta Lake'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: Energy Efficiency Retrofits

2020 GHG Reduction Potential: 25 MT CO₂e/yr

2035 GHG Reduction Potential: 56 MT CO₂e/yr

Fifty eight percent of homes in Shasta Lake were built before the State of California adopted the Title 24 energy efficiency requirements in 1980. Energy efficiency retrofits help residents reduce their utility bills and the community's building-related emissions. Energy audits can identify inefficient heating and cooling systems and gaps in the building's envelope through which heat can escape or enter. Audits can also help homeowners and building owners prioritize cost-effective retrofit investments to maximize their financial returns.

In 2007, the City began outreach efforts to promote energy efficiency retrofits in existing residential buildings. The Shasta Lake Electric Utility manages a strong and comprehensive energy efficiency incentive program for residential and commercial customers focusing on peak load reduction, energy conservation, and renewable energy generation. Existing programs include:

Energy efficiency hotline: A toll free line is available for the residential customers to answer questions and provide information on energy efficiency and energy savings-related topics.

Free residential energy audits: City energy specialists provide on-site audits of homes and recommend energy efficiency measures upon customer request. Customers are also provided a written report summarizing all findings.

Free commercial energy audits: City energy specialists provide on-site audits of commercial and industrial customers. The City also schedules follow-up visits during the audit and provides rebates for upgrades to ensure proper implementation of recommended energy efficiency measures. Post-installation verification services are also provided by the City utility department.

Residential rebate programs: The City provides comprehensive technical support and incentives for installing high-efficiency cooling and refrigeration equipment, envelope measures, Energy Star appliances and lighting upgrades.

Weatherization incentives: Financial incentives are provided to homeowners who want to invest in weatherization measures, including insulation and window treatments/replacements.

“Kill a Watt” program: Residents can check out a P3 Kill-a-Watt power meter free of charge for 15 days. These meters display the total consumption of 120 volt appliances to help residents understand which appliances in their home consume the most energy.

One-stop permit center: The City provides information regarding energy conservation methods to owners of older homes, landlords, new homeowners and owners undertaking renovations.

The City will continue to expand programs that promote energy efficiency retrofits in existing residential buildings. The City will use newspaper advertisements, website promotion and community event giveaways as part of education outreach efforts based on funding availability. The City will also encourage use of other available resources such as California Flex Your Power, the Department of Energy’s (DOE) Weatherization Assistance Program, and PG&E’s SmartEnergy Analyzer™ program, all of which link residential property owners to educational and financial resources. The City will emphasize voluntary participation in these energy efficiency retrofit programs, in lieu of mandatory requirements.

ACTION		RESPONSIBILITY
Short-Term		
A	Continue to promote and improve utility incentives for energy conservation programs for older homes and renovations through the One-Stop Permit Center and Electric Utility Department.	Development Services; Electric Utility
B	Facilitate the use of energy efficient demonstration homes as an education and promotion tool.	Development Services
PROGRESS INDICATORS		YEAR
1	2% of existing single family residential units and 2% of multi-family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, AC refrigerant recharge)	2020
2	4.5% of existing single family residential units and 4.5% of multi-family residential units perform cost-effective energy efficiency package improvements (e.g., insulation, duct sealing, and AC refrigerant recharge)	2035



Measure BE-2: New Construction

2020 GHG Reduction Potential: Included in Title-24 State Reductions

2035 GHG Reduction Potential: Included in Title-24 State Reductions

The City has been proactive about promoting building energy efficiency through utility incentives and streamlined permitting. The City maintains a One-Stop Permit Center that, in coordination with the Electric Utility Department, provides information on energy efficient construction and operations to builders and new home owners through newspaper advertisement, website promotion and community event giveaways. Contingent upon future availability of funding, the City will continue to promote and improve utility incentives and distribution of building performance-related information.

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 City will offer priority permitting to new residential projects that demonstrate 15% higher energy efficiency 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 City anticipates that more than 50% of all new construction in the City will be subject to the 2013 Title 24 standards. The City's 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 City believes it is not prudent to require efficiency at a level higher than the State's standard. The City will not adopt an efficiency standard more stringent than the State's code.

ACTION		RESPONSIBILITY
Short-Term		
A	Continue to promote and provide utility incentives for energy efficiency programs in new residential buildings through the One-Stop Permit Center and Electric Utility Department.	Electric Utility; Development Services
B	Develop a priority permitting program for new residential projects that demonstrate 15% higher efficiency than Title 24 requirements.	Development Services
PROGRESS INDICATORS		YEAR
1	50% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.	2020
2	80% of new construction to achieve 25% reduction in energy use above 2008 Title 24 energy efficiency standards.	2035



Measure BE-3: Commercial Lighting

2020 GHG Reduction Potential: 137 MT CO₂e/yr

2035 GHG Reduction Potential: 236 MT CO₂e/yr

There is approximately 300,000 square feet of non-residential building space in Shasta Lake. Conventional commercial lighting used to illuminate these buildings, including T12 fluorescent bulbs, consumes more energy than new T8 or T5 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.

The City currently provides a commercial lighting retrofit program to all businesses, to replace old inefficient T-12 fixtures with energy-efficient fluorescent lighting. The lighting upgrade program includes rebates for fixtures, lamps, accent/directional lighting, controls and occupancy sensors, and signage.

The City will continue promotion of this program to the community's businesses and institutional building owners. The City will expand this program to also focus on parking lot and public area lighting.

ACTION		RESPONSIBILITY
Short-Term		
A	Continue to promote and provide utility incentives for commercial interior lighting retrofits.	Electric Utility
Medium-Term		
B	Develop a parking lot and public area lighting-specific outreach program.	Electric Utility
PROGRESS INDICATORS		YEAR
1	90% of businesses improve interior lighting efficiency by 40% and 20% of businesses improve exterior lighting efficiency by 20%.	2020
2	100% of businesses improve interior lighting efficiency by 40% and 45% of businesses improve exterior lighting efficiency by 40%.	2035



Measure BE-4: Efficient Appliances

2020 GHG Reduction Potential: 173 MT CO₂e/yr

2035 GHG Reduction Potential: 625 MT CO₂e/yr

This measure is designed to encourage voluntary community participation to upgrade home appliances to Energy Star or other energy efficient models. Modern technology has contributed to the development of high-quality, energy efficient appliances. The Energy Star rating is a nationally recognized standard for energy efficient consumer products. According to the EPA, devices that have an Energy Star certification, such as office equipment, home appliances, and lighting products, generally use 20 to 30 percent less energy than required by federal standards.

The City provides one of the highest rebate programs in the State. The City will continue to promote appliance rebate programs through additional outreach to residents and businesses through newspaper advertisements, website promotion and community event giveaways, contingent upon available

funding. The City will also work to leverage Energy Upgrade California program materials and rebates to increase communitywide awareness regarding energy efficient appliance choices. By promoting Energy Star-rated home and business appliances, the City can help to reduce GHG emissions related to the use of lighting, refrigerators, dishwashers, clothes washers, wall air conditioning units, computers, photocopiers, lights, etc.

The City will continue to provide comprehensive technical support and incentives for installing high-efficiency cooling and refrigeration equipment, and Energy Star appliances. As part of this service, the City will continue to promote its “Kill-a-Watt” Power Meter Program. This program, managed through an online application on the City’s website, allows residents to check out a P3 Kill-a-Watt power meter for no charge up to 15 days. These meters display the total consumption of 120 volt appliances to help residents understand which appliances in their homes consume the most energy and then adjust the time of use of high energy-using appliances to save on utility bills.

ACTION		RESPONSIBILITY
Short-Term		
A	Continue community educational outreach and distribution of information regarding efficient appliances and utility rebate programs through the One-Stop Permit Center and Electric Utility Department.	Development Services Electric Utility
B	Continue the Kill-a-Watt program.	Electric Utility
PROGRESS INDICATORS		YEAR
1	20% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models. 80% of new homes will install Energy Star refrigerators, and 90% of new homes will install Energy Star dishwashers and clothes washers.	2020
2	45% of existing homes will replace old model refrigerators, dishwashers, and clothes washers with new Energy Star models. 90% of new homes will install Energy Star refrigerators, dishwashers and clothes washers.	2035



Measure BE-5: Solar Water Heaters

2020 GHG Reduction Potential: 254 MT CO₂e/yr

2035 GHG Reduction Potential: 668 MT CO₂e/yr

Shasta Lake’s location results 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 hot water systems are a simple and reliable method for harnessing the sun's energy to provide for hot water needs.

Solar hot water systems can be a cost-effective replacement for inefficient water heaters. According to the California Solar Initiative (CSI), solar hot water systems can lower energy bills by meeting 50 to 80 percent of hot water needs. Though the high capital cost of solar water heater upgrades can pose a financial burden to homeowners, there are a range of financing and rebate options to offset these initial investment costs. The California Solar Water Heating and Efficiency Act of 2007 (AB 1470), created a 10-year program aimed at installing solar water heaters in homes and businesses. AB 1470 was designed to lower the initial costs of purchasing a system, which averages around \$3,000-\$6,000.

The City will identify the additional financing and rebate options for residents to voluntarily replace inefficient water heating systems with solar water heaters. During retrofit the City will encourage customers to switch to electric backup water heating systems, which will result in additional GHG reductions when compared to natural gas heaters. There are a number of financing options that may be used to reduce upfront costs, such as federal tax incentives through the Energy Policy Act of 2005, and financial incentives through AB 1470. The City will work with the California Solar Initiative to create outreach programs to provide information about the benefits of solar hot water heaters to encourage participation. The City will create a streamlined permit process for solar water heater installation.

ACTION		RESPONSIBILITY
Short-Term		
A	Work with California Solar Initiative to develop an outreach program to maximize installation of solar hot water systems in residential buildings.	Development Services Electric Utility
B	Streamline permitting (e.g., building, electric, plumbing) for solar hot water system installation.	Development Services
PROGRESS INDICATORS		YEAR
1	10% of residences and businesses will install a solar hot water system.	2020
2	22.5% of residences and businesses will install a solar hot water system.	2035



Measure BE-6: Solar Photovoltaic Systems

2020 GHG Reduction Potential: 867 MT CO₂e/yr

2035 GHG Reduction Potential: 2007 MT CO₂e/yr

As mentioned in Measure BE-5, Shasta Lake 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.

Numerous barriers may prevent widespread adoption of solar PV technology including City regulations and initial up-front costs. 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 City currently offers a Photovoltaic (PV) Buy-Down Program to help offset residents and businesses' investment in a PV system. The City provides rebates through this program to reduce the initial system cost for owners.

Additionally, 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. 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 City will develop a multi-pronged approach to remove barriers to PV installation. The City will review its regulations, ordinances, and codes to identify any barriers to solar project installation. The City 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 City 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	Review City regulations, ordinances, and codes to identify and remove, when appropriate, any barriers to solar system installation.	Electric Utility
B	Develop a solar outreach campaign that encourages property owners to install PV systems and participate in PPA agreements with solar service providers.	Electric Utility
PROGRESS INDICATORS		YEAR
1	3% of single-family homes install 3.0 kW solar PV systems; 100,000 SF of non-residential PV systems installed in the community.	2020
2	6.8% of single-family homes install 3.0 kW solar PV systems; 225,000 SF of non-residential PV systems installed in the community.	2035

WATER MEASURE:

Water-related GHG emissions are mainly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. Emissions associated with this energy use accounted for approximately 3% of the communitywide GHG inventory in 2008.



Measure W-1: Water Conservation

2020 GHG Reduction Potential: 314 MT CO₂e/yr

2035 GHG Reduction Potential: 355 MT CO₂e/yr

The State's 2009 Comprehensive Water Package (SB-7X) requires water providers who provide potable municipal water to more than 3,000 end users or that supply more than 3,000 acre-feet of potable water annually to reduce per capita water consumption by 2020 - a 20% reduction from the average water demand between 1995 and 2010. The City serves approximately 3,650 end users and, therefore, is required to comply with SB-7X. In response to this requirement, the City plans to implement a series of water conservation initiatives. This measure assumes successful achievement of the required reduction.

ACTION	RESPONSIBILITY
Medium-Term	
A Implement conservation programs identified within the City's Water Management Plan.	Water Treatment Superintendent Public Works
PROGRESS INDICATORS	YEAR
1 Reduce urban water use by 20% per capita below average water demand (1995-2010)	2020
2 Maintain urban water use by 20% per capita below average water demand (1995-2010)	2035

SOLID WASTE MEASURES:

The decomposition of the community's solid waste in landfills generated approximately 3% of Shasta Lake's communitywide GHG emissions in 2008. The solid 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: Enhanced Organic Waste Diversion

2020 GHG Reduction Potential: 118 MT CO₂e/yr

2035 GHG Reduction Potential: 312 MT CO₂e/yr

Shasta Lake promotes waste diversion from landfills by providing separate waste bins for trash, recyclable items and green yard waste. In the short-term, the City will augment existing waste diversion programs, conduct a variety of outreach programs to increase participation in waste reduction, recycling and composting programs, and work with waste hauling operators to ensure achievement of this goal. Specifically the City will develop an outreach program to encourage enhanced yard waste collection and construction and demolition waste diversion. The City will enforce the State requirement that builders divert 50% of all construction and demolition related waste.

The City will also implement a commercial recycling program designed to divert commercial solid waste generated by businesses pursuant to Public Resources Code Section 42649 *et seq.* "Business" is defined as any commercial or public entity that generates four cubic yards or more of commercial solid waste per week, multi-family residential complexes of five units or more, and any other commercial entity identified by the City as being a source of commercial solid waste. Components of the program will include education and outreach to businesses, and identification and monitoring of businesses to assess compliance with the regulations.

ACTION	RESPONSIBILITY
Short-Term	
A Enhance implementation of existing recycling and composting programs through education and outreach, including specific enhanced yard waste and construction and demolition waste diversion programs.	Finance Dept. Development Services

B	Incorporate waste reduction measures into future solid waste and recycling franchise agreements.	Finance Dept.
C	Implement a commercial recycling program to divert commercial solid waste.	Finance Dept. Development Services
PROGRESS INDICATORS		YEAR
1	Community increases diversion of yard and construction and demolition wastes by 50%.	2020
2	Community maintains diversion of yard and construction and demolition wastes at 50%.	2035



Measure SW-2: Methane Recovery

2020 GHG Reduction Potential: 2,551 MT CO₂e/yr

2035 GHG Reduction Potential: 3,207 MT CO₂e/yr

The Air Resources Board approved a regulation to reduce methane emissions from municipal solid waste landfills as an early implementing action of the California Global Warming Solutions Act (Assembly Bill 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 the community: 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’s action effectively reduces the City’s solid waste-related emissions. The City will consult with County staff to ensure methane capture is achieved.

ACTION		RESPONSIBILITY
Short-Term		
A	Consult with County staff to verify the installed methane capture system at the West Central Landfill achieves the estimated 75% control efficiency.	Wastewater Treatment Superintendent
PROGRESS INDICATORS		YEAR
1	West Central Landfill achieves a methane control efficiency of 75%.	2020
2	West Central Landfill achieves a methane control efficiency of 75%.	2035

TRANSPORTATION/LAND USE MEASURES:

The use of motor vehicles for transporting people and products generated approximately 33% of Shasta Lake’s communitywide GHG emissions in 2008. The transportation-related measures described on the following pages describe the City’s efforts to reduce auto-dependence in new development and improve biking and walking infrastructure within the community.



Measure T-1: Mixed Use Development

2020 GHG Reduction Potential: 290 MT CO₂e/yr

2035 GHG Reduction Potential: 1,093 MT CO₂e/yr

Research demonstrates that average daily shopping and errand trips in well serviced neighborhoods are less than half the distance than in neighborhoods with low levels of diversity. This research also indicates that residents who live within ¼ to ½ mile of neighborhood commercial centers are more likely to walk or bike in order to purchase daily goods and services. Enhancing the quality and diversity of uses in the City’s neighborhood commercial areas will help decrease transportation-related GHG emissions and improve residents’ quality of life.

Shasta Lake will complete a comprehensive update of the General Plan to incorporate healthy community principles and standards. The City will also provide streamlined permit processing for higher density residential and mixed-use development within the City.. Presently, most of the mixed-use development in the City is along Shasta Dam Boulevard. The City will continue to evaluate additional areas in the City and consider adopting mixed-use residential, commercial, and office zoning to encourage active circulation (walking and bicycling) to reduce dependence on cars and therefore, help to reduce the household average vehicle miles traveled (VMT).

ACTION	RESPONSIBILITY
Short-Term	
A Update General Plan to incorporate healthy community goals and policies.	Development Services
B Conduct a community visioning process to identify the goals for commercial retrofits and new mixed-use centers, and recommend sites with the highest potential.	Development Services
C Create streamlined permitting process for higher density and mixed-use developments.	Development Services
Medium-Term	
D Develop commercial retrofit and mixed-use development design guidelines.	Development Services
PROGRESS INDICATORS	YEAR
1 70% of all new residential units constructed in mixed-use development.	2020
2 70% of all new residential units constructed in mixed-use development.	2035



Measure T-2: Bicycle Lane Expansion

2020 GHG Reduction Potential: 14 MT CO₂e/yr

2035 GHG Reduction Potential: 54 MT CO₂e/yr

As a testament to the City's commitment toward complete streets policy, the City will update the Circulation Element of the General Plan. The City understands the importance of creating a balanced multi-modal transportation network that meets the needs of all users, such as pedestrians, bicyclists, motorists, movers of commercial goods, and users of public transportation. Therefore, during project review the City will also require that bike and pedestrian connections are provided to destinations within and adjoining the project (for example, connection to transit stops, commercial/neighborhood centers, parks and schools).

Furthermore, to enhance biking infrastructure in Shasta Lake, the City will establish minimum standards for the ratio of bicycle lanes and paths to miles of road. Per the 2009 Bicycle Transportation Plan, the City of Shasta Lake currently has:

- 0.3 miles of existing Class I Bikeways (with non-standard signing & pavement delineation)
- 5.2 miles of existing Class II Bikeways
- 1.6 miles of existing Class II Bikeways (with non-standard signing & pavement delineation); and
- No existing Class III Bikeways

The City will continue to pursue grant funding for implementing the Shasta Lake Bike Plan with the goal of adding 10 miles of Class I and II bikeways by 2020; 20 miles of Class I and II bikeways by 2035; and 9 miles of Class III bikeways by 2035. The City will also seek funding to install additional Healthy Shasta Bicycle Racks.

ACTION	RESPONSIBILITY
Short-Term	
A Continue to pursue grant funding opportunities to implement the Shasta Lake Bike Plan. For example, continue to pursue grant funding through Healthy Shasta to identify appropriate public locations for the installation of Healthy Shasta bicycle racks.	Public Works; Development Services
B Establish standards for the ratio of bicycle lanes and paths to miles of road	Public Works
C Complete design guidelines and design standards to promote installation of bicycle infrastructure.	Development Services
Medium-Term	
D Develop appropriate bicycle infrastructure for high traffic street segments and intersections.	Public Works
E Implement a bicycle way finding / signage program.	Public Works
PROGRESS INDICATORS	YEAR
1 10 new miles of Class I and II bikeways constructed.	2020
2 20 new miles of Class I and II bikeways constructed.	2035
3 9 new miles of Class III bikeways constructed.	2035



Measure T-3: Pedestrian Environment Enhancements

2020 GHG Reduction Potential: 31 MT CO₂e/yr

2035 GHG Reduction Potential: 97 MT CO₂e/yr

A well connected network of sidewalks, trails, and crosswalks creates a pedestrian environment that encourages walking and improves community health. The Community Health Assessment completed for the City in July 2009 identified the need for a variety of pedestrian infrastructure enhancements. The City will continue to pursue Safe Routes to School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements. The City will also continue to pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network, and the extensions of existing sidewalks to provide access to desired areas of the City.

All new discretionary projects will develop multiuse trails that connect to regional trails and link neighborhoods to schools, shopping areas, areas of employment and recreational areas, when feasible.

ACTION	RESPONSIBILITY
Short-Term	
A Pursue Safe-Routes-to-School and other funding for construction of new sidewalks, bicycle lanes, school crossings, traffic control, and roadway improvements.	Public Works
B Identify existing gaps in sidewalk infrastructure within the City and develop an implementation plan to remove gaps and other barriers to pedestrian connectivity in the community.	Public Works
C Pursue grant funding for the repair and improvement of existing sidewalks, the completion of any gaps in the sidewalk network.	Public Works
Medium-Term	
D Develop an ordinance that requires new discretionary projects to develop multiuse trails, when feasible.	Development Services
PROGRESS INDICATORS	YEAR
1 Improve pedestrian infrastructure and conditions in 3% of streets in the community.	2020
2 Improve pedestrian infrastructure and conditions in 6.8% of streets in the community.	2035

CARBON SEQUESTRATION MEASURES:

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



Measure GI-1: Urban Forest

2020 GHG Reduction Potential: 190 MT CO₂e/yr

2035 GHG Reduction Potential: 440 MT CO₂e/yr

An “urban forest” encompasses all of the trees in a community, from street trees and private landscapes to parks and natural, open spaces. The urban forest can shade buildings and streets, improving community comfort and reducing the need for building air conditioning. Trees also provide improved water and air quality, increased wildlife habitat, and neighborhood beautification.

Trees can help the City 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 City will continue to evaluate the carbon sequestration potential of planned urban forestry projects. The City will continue to require trees be planted in new public projects and residential and commercial developments. The City will also identify potential locations for and plant additional street trees within the downtown commercial area, when feasible. Furthermore, the City will develop an outreach campaign to encourage the planting of shade trees on private residential and commercial properties.

ACTION		RESPONSIBILITY
Short-Term		
A	Develop outreach program to advertise the benefits of planting shade trees around buildings and parking lots.	Development Services
B	Evaluate the carbon sequestration potential of planned urban forestry projects.	Electric Utility
Medium-Term		
D	Identify potential locations and plant trees within the downtown commercial area.	Development Services Public Works
PROGRESS INDICATORS		YEAR
1	3,000 new shade trees are planted throughout the City.	2020
2	6,750 new shade trees are planted throughout the City.	2035

IMPLEMENTATION AND MONITORING

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

- **Measure Implementation** - Describes how City 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 City 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 City will carry out. The table also identifies responsible departments for each action. The second section of each table provides progress indicators that enable City staff, the City Council, 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 City departments identified will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee this work action implementation. Some actions will require inter-departmental or inter-agency cooperation, and appropriate partnerships will need to be established. The City would also need to assess its progress toward measure implementation.

PROGRAM EVALUATION AND EVOLUTION

The CAP represents the City'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 evaluations 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 City 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 City will coordinate communitywide inventories in 2015, 2020, 2025, 2030, and 2035 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 City can promote and reinforce successful measures and reevaluate or replace underperforming ones. Evaluating measure performance will require data regarding actual community participation rates and measurement of GHG reduction capacity.

The City will coordinate measure evaluation on the same schedule as the communitywide inventories, and summarize the progress toward 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 City 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 goal. As part of the evaluations identified above, the City 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. The City must complete environmental review prior to adoption of the CAP (an environmental impact report, negative declaration or mitigated negative declaration) pursuant to CEQA Guidelines Sections 15185.5(b)(1)(F) and 15183.5(b)(2) in order to allow tiering for future projects.

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 each of the following mandatory measures, the CAP either reinforces the implementation of current codes and ordinances, or recommends changes to the City's codes and ordinances that would result in GHG reductions.

■ **Measure BE-2: New Construction**

All new projects would be required to comply with these codes and ordinances, as applicable. This would make these measures 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 each 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.

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