

CHAPTER 1: INTRODUCTION

Chapter 1 explains the context, purpose, and scope of the plan, outlines the development of the plan, and provides a brief guide to the document. Background on the Sonora community and leading energy efficiency efforts that the City has prioritized is also provided.

Definition of Key Terms

Table 1-1: Definition of Key Terms

Key Term	Definition
Goal	An expression of a desired outcome or an ideal future result or condition based on community priorities and vision. Goals are not quantifiable or time-dependent but rather represent the end state. Example: Improve public safety.
Strategy	An intermediate step between a goal and an action. Strategies define specific pathways that, if followed, will help achieve the goal. Example: Improve lighting conditions in public spaces.
Action	Individual activities the jurisdiction will undertake to implement an energy-efficiency strategy. A strategy can have several actions. Example: Review existing lighting conditions and install new light fixtures where required.
Community Member	A community member is a resident, business owner, or worker in the City of Sonora.
Water-Energy Nexus	This term is used to describe the intersection of water and energy resources. Energy is required for the collection, transportation, treatment, distribution, and disposal of water and wastewater. Therefore reducing water use and wastewater generated, reduces the energy required to provide water and treat wastewater.
Zero Net Energy	A building that uses energy equivalent to the amount produced on-site.
Title 24	Title 24, Part 6 is the section of the California building code dealing with energy. Building Energy Efficiency Standards are designed to ensure new buildings and significant remodels achieve cost effective energy performance and preserve outdoor and indoor environmental quality.
Leak Loss Detection	Leak Loss Detection is a state of the industry practice to proactively identify and fix leaks in the water system, before pipes break and leaks surface, in order to reduce water losses and the costs to fix the leaks.

Why Prepare an Energy Action Plan?

In 2010, the Sonora community - including residential, non-residential, City, and public agencies - consumed 60,306,795 kWhs of electricity and an estimated 1,903,951 gallons of propane and 1,529 cords of wood costing an estimated \$14

million.¹ The majority of this money leaves the community. Instead through efficiency and local energy projects, Sonora residents and businesses can reduce their energy use through efficiency projects that pay for themselves over time, some in as little as 6 months, or completely eliminate their energy costs through on-site renewable energy projects, which often pay for themselves between 6 and 12 years depending system size and financing options. Additionally, because of the projected increase in occupied housing and employment in Sonora, the community's residential energy use is forecasted to increase by 5.45% by 2035 and non-residential energy use is forecasted to increase by 19.58% by 2035. By implementing this plan, the community could realize the following benefits:

Energy & Money Savings

Community Resiliency

Local Air Quality Improvements

The economies of Sierra Nevada communities rely heavily on natural resources for tourism, recreation, forestry, agriculture and other industries. Changes in weather patterns resulting in extreme weather events, greater year-to-year variation in precipitation and temperature extremes have the potential to adversely affect the vitality of these natural resources, which in turn directly impacts the businesses and residents in these communities.

Communities can more readily and flexibly meet their energy needs and lessen the grid impacts (an over stressed grid often results in rolling blackouts and power outages) when efficiency is improved and local renewable energy systems are combined with energy storage. Retrofitting homes and businesses to be more efficient reduces energy costs, improves air quality, creates local jobs, and makes homes and businesses more comfortable. In addition, money saved on energy bills can instead be spent at local businesses, thus stimulating the local economy. Finally, prioritizing energy efficiency, local renewable energy, and water efficiency will enhance the City's ability to respond to the ever-changing external conditions related to energy supply and demand, and help community members become more self-sufficient and resilient to future changes in energy prices and weather.

The plan sets goals and recommends strategies and actions that support the efforts of the community to increase energy efficiency, expand energy independence through local generation and storage of renewable energy, and address the water-energy nexus by reducing water waste and by more efficiently transporting and using water resources. It is intended to guide local government decisions that will help achieve greater efficiency, reduce costs, and demonstrate the City's commitment to energy independence and community resilience. It is also intended to inspire residents, businesses, and

Who does the plan benefit?

Local Residents

Business Owners

Sonora City Staff

How?

Saving energy and money

Improving quality & comfort of life

Increasing participation in programs and partnerships

¹ Average composite rate for 2010 of \$0.156 per kWh based on ratio PG&E and TPPA Rates, 2010 average rate of \$2.21 per gallon of propane based on 2010 Energy Information Agency West Coast Annual Average Retail Prices. Accessed September 22, 2017. http://www.eia.gov/dnav/pet/pet_sum_mkt_dcu_R50_a.htm, and 2010 average of \$275 per cord estimated based on local listings for soft and hardwood.

other public agencies in Sonora to participate in community efforts and maximize energy efficiency, renewable energy and water efficiency.

Most energy projects are cost-effective because energy savings are seen immediately, and the money saved on energy not used offsets the upfront costs over time. Depending on the size and scope of the project, energy projects can pay for themselves in anywhere from a few months to several years. Often with financing, projects can be cash flow positive from day one. The money saved through energy projects can then be reinvested into the local economy.

Climate Science Basics

Naturally occurring gases² dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect, which is a natural process that perpetuates life on earth by keeping the planet's surface warm. Scientific observation indicates that average air and ocean temperatures have steadily increased globally over the last 100 years. Evidence of this includes rapid levels of glacial melt, reductions in sea ice, shorter freezing seasons, and decreases in snowpack.

Scientific studies suggest that human activities are accelerating the concentration of greenhouse gases (GHG), which affects the global climate. The most significant contributor is the burning of fossil fuels for transportation and electricity generation, which introduces large amounts of carbon dioxide and other GHGs into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface temperatures to rise.³

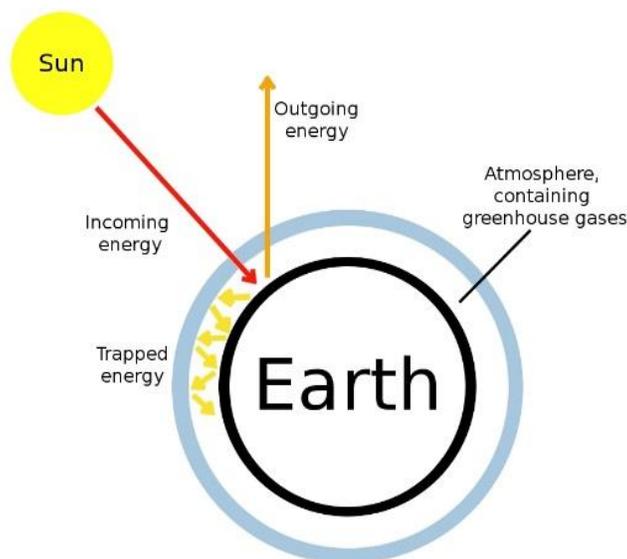


Image Credit: simpleclimate.wordpress.com

Local Climate Change Impacts

Sonora, like most communities in the Sierra Nevada, faces challenges associated with regional climate change. Increased frequency and altered timing of flooding will increase risks to agriculture, people, ecosystems and infrastructure. Potential impacts on water resources include reduced mountain snowpack, delayed snow accumulation, earlier snow melting and ultimately shortages in runoff and water supply. Extended droughts may increase wildland fire risk. Since local economies in the area rely heavily on these resources for agriculture, tourism, recreation and other industries, climate change may negatively affect economic activity in the City, and ultimately impact quality of life for community members.⁴

Though this plan does not address the impacts of climate change beyond the energy sector, the Sierra Climate Adaptation and Mitigation Partnership (Sierra CAMP) provides resources, information, and action opportunities to its partners within the Sierra for acting on climate change and improving community resiliency. Individuals or organizations interested in engaging with Sierra CAMP should contact Nikki Caravelli at ncaravelli@sierrabusiness.org. For more information visit the website at www.sbcsierracamp.org.

² The primary gases occurring naturally in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide and ozone.

³ Intergovernmental Panel on Climate Change. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp.

⁴ California Office of Environmental Health Hazard Assessment. 2013 Report: Indicators of Climate Change in California. Accessed September 22, 2017. <http://www.oehha.ca.gov/multimedia/epic/2013EnvIndicatorReport.html>

Regulatory Context

California is a leader in developing policies to boost savings from energy efficiency efforts and lower greenhouse gas emissions. These policies are some of the drivers behind the completion of energy planning at the local level:

Table 1-2: Regulatory Context

1978	<ul style="list-style-type: none"> • Title 24, Part 6. Energy Efficiency Standards first adopted in 1978. Ongoing updates. Established minimum energy efficiency performance standards for residential and non-residential buildings. Effective January 1, 2020 new energy efficiency standards will require near zero net energy for residential cost-effectively through efficiency and onsite renewable energy.
2002	<ul style="list-style-type: none"> • Senate Bill 1078. Established Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs), electric service providers, and community choice aggregators to acquire 20% of their electricity from renewable resources by 2010 and 33% by 2020.
2005	<ul style="list-style-type: none"> • Executive Order S-3-05. Governor's Executive Order. Set GHG reduction targets for state agencies at Year 2000 levels by 2010, 1990 levels by 2020 and 80% below 1990 levels by 2050.
2006	<ul style="list-style-type: none"> • Assembly Bill 32. Landmark legislation that requires the California Air Resources Board (ARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.
2007	<ul style="list-style-type: none"> • Senate Bill 97. Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act.
2011	<ul style="list-style-type: none"> • CALGreen. Enhances sustainable construction practices through mandatory and voluntary measures including reduced construction waste, water conservation, non-toxic sealants and use of renewable materials. Now part of Title 24 and updated on same schedule.
2015	<ul style="list-style-type: none"> • Senate Bill 350. Expanded the Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs), electric service providers, and community choice aggregators to acquire 50% of their electricity from renewable resources by 2030.
2016	<ul style="list-style-type: none"> • Senate Bill 32. Expands upon AB 32 and requires the California ARB to develop regulatory and market mechanisms that will ensure that statewide greenhouse gas emissions are reduced to 40% below 1990 levels by 2030.
2017	<ul style="list-style-type: none"> • Assembly Bill 398. Extends the cap-and-trade program mandated by AB 32 to continue through 2030.

Economic Opportunities

One of the potential outcomes of implementing the plan is increased investment in the clean energy industry which could open the door to new economic development opportunities in the City and surrounding communities. Some economic benefits include increased opportunities to train the local workforce in industries that directly affect the energy and water sectors. Additionally, the following indicators suggest a robust market for clean economy businesses and industries as we move forward into the next decade.⁵

- California has more patent registrations in clean technology than any other state.
- California leads the nation in energy storage systems development and innovation.

⁵ 2014 California Green Innovation Index, 6th Edition. Next 10. p. 29, 33-44. Accessed September 22, 2017. <http://greeninnovationindex.org/sites/greeninnovationindex.radicaldesigns.org/files/2014-Green-Innovation-Index.pdf>.

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- Jobs within California's Core Clean Economy⁶ increased by 20% in the last decade (January 2002 to 2012) while the total state economy increased 2%.
- Within California's Core Clean Economy, the service sector ranked highest (57%) followed by manufacturing (13%), installation (11%), supplier (10%) and research and development (7%).
- California's clean manufacturing jobs over the last decade were up 53%, while total state economy manufacturing fell by 21%.

Relationship to CEQA

The City of Sonora determined the acceptance of the EAP is exempt from the California Environmental Quality Act (CEQA) per section 15061 (b) (3) of the CEQA guidelines:

The activity is covered by the general rule that CEQA applies only to projects which have the potential for causing a significant effect on the environment. Where it can be seen with certainty that there is no possibility that the activity in question may have a significant effect on the environment, the activity is not subject to CEQA.

Energy Action Plan Development

The path to the EAP began in 2017 when the City engaged Sierra Business Council (SBC) to develop a roadmap for the community to reduce energy use and costs. Energy consumption data was gathered for baseline year 2010 and the baseline energy use data was forecasted out to 2035 using local and regional growth projections validated by City staff. The data gathered during the inventory and forecasting process helped identify those activities within the community that consumed the most energy. This information pointed the way towards areas where the greatest energy-efficiency improvements could be realized, resulting in a series of goals, strategies, and actions the City and community can undertake to reduce energy use as well as money spent on energy.

Community involvement is an essential part of all successful planning efforts, and input was widely sought throughout the City to ensure the scope of the plan is appropriate, the goals are realistic, and the actions are doable. The public outreach strategy included an online survey and a community study session hosted by the Sonora Planning Commission on June 12, 2017. The online survey was kept open from May 25th, 2017 to June 30th, 2017 and received 28 responses. Both the survey and study session were publicized in the Union Democrat, at the City Hall offices, and directly distributed to more than 100 local businesses. Additionally, the plan was presented at the March 5th, 2018 City Council meeting and accepted by the Council 5-0.

⁶ The key clean sectors of California's economy, which includes energy efficiency, clean generation, and storage.

Figure 1-3: Public Input Summary

Public Input Summary

Respondent Profile

86% from City of Sonora residents

4% age 19 to 24
25% age 25 to 44
64% age 45 to 64
7% age 65+

64% homeowners
46% business owners

Goal 1: Improve Energy Efficiency

- 90% familiar with energy efficiency practices in the home and 56% for business operations
- 58% have used utility rebates for energy efficiency measures
- 25% interested in completing a home energy audit and 22% a business energy audit.

Goal 2: Expand Renewable Energy and Resilience

- 88% do not currently own or lease a renewable energy system
- Solar ranked 1st for most viable renewable energy option in area
- 18% interested in site assessment for solar system

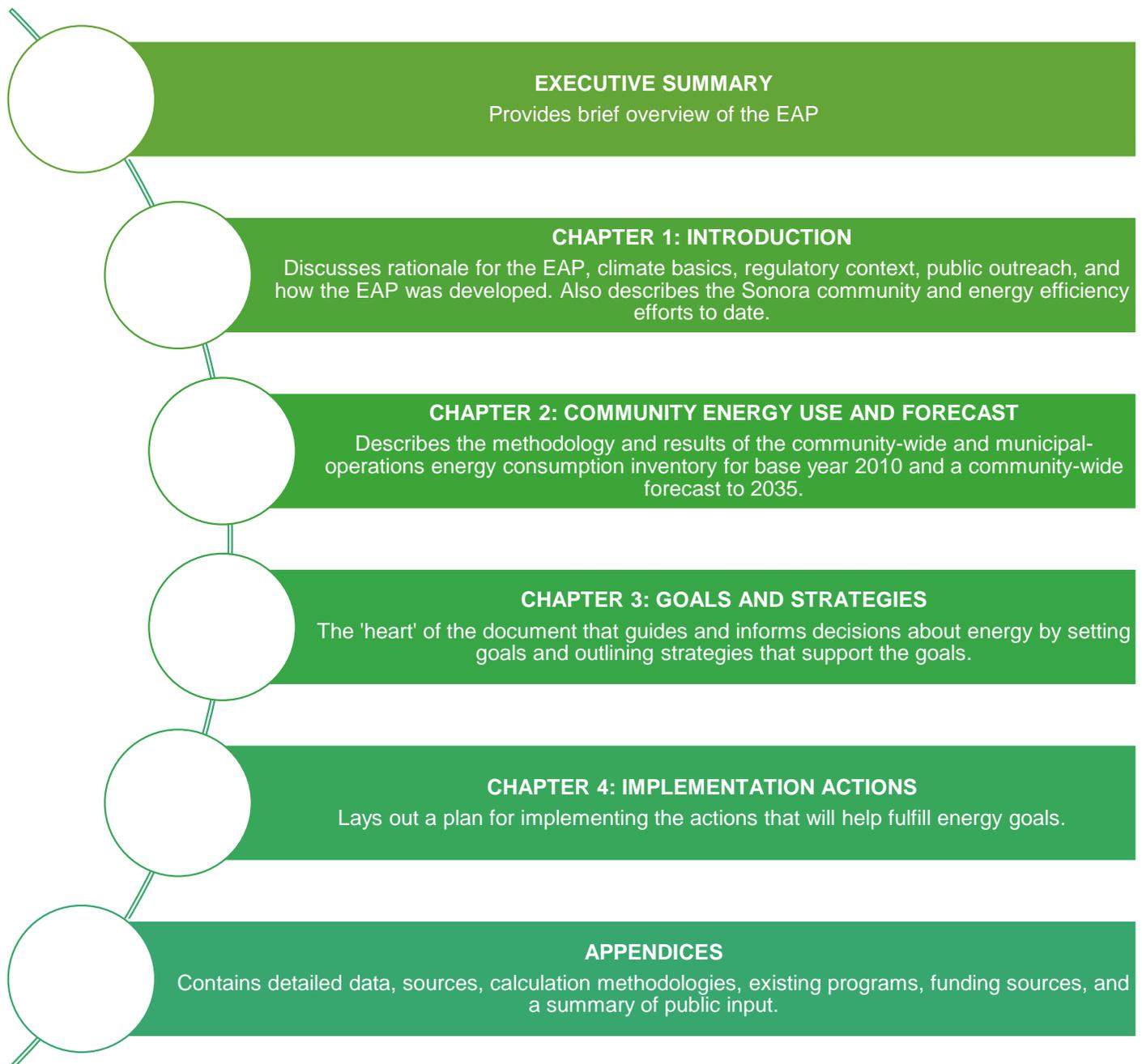
Goal 3: Increase Water Energy Efficiency

- 41% aware of water efficiency and water conservation programs
- 12% participated in utility rebate or incentive programs for water efficiency or conservation programs
- 18% interested in getting an assessment of water use.

User’s Guide to the Report

The EAP can be used as a tool to guide municipal and community decisions regarding the best ways to improve energy efficiency in homes, businesses, and municipal facilities. It is designed as an integrated ‘living’ document that can be modified and augmented as new information, programs, and technologies become available. The following diagram describes the information contained in the four chapters and appendices of the EAP. It serves as a roadmap to assist the reader in accessing relevant information on existing and future energy consumption, policy direction, implementation actions, performance targets and a work plan for implementing the EAP.

Table 1-4: Energy Action Plan Content and Organization



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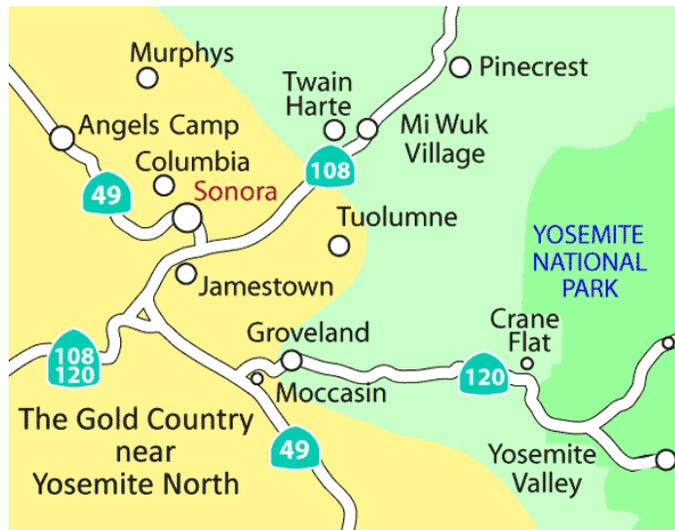
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Community Profile

The City of Sonora is the County seat of Tuolumne County and is one of the oldest cities in California. It is located on the West side of the Sierra Nevada mountain range in central California. It was incorporated on May 1, 1851 and has historically been referred to as the “Queen of the Southern Mines”, located in the heart of the California Gold Country. Established as a mining town during the California Gold Rush, the City quickly evolved into the commercial center of the region.

Sonora has a total area of 3.1 square miles and is intersected by California Highway 49 and bordered to the south by California Highway 108. The population of approximately 4,903 residents increases to nearly 25,000 people during the daytime due to the high number of employees and tourists entering the city.⁷ The City runs its own Police, Fire, Public Works, Administrative Services, and Community Development departments. Other services the City provides include a microenterprise assistance program, loans for housing assistance, and a debris pickup program.⁸ Electricity for businesses and residents in the city is provided by Pacific Gas and Electric (PG&E). Electricity for public agencies in the city is provided by Tuolumne Public Power Authority (TPPA). Propane is provided by several local and regional suppliers.



Map of Sonora, courtesy of www.sonoraca.net

July and August are the hottest months for the city with average highs around 70 degrees Fahrenheit, while in December and January lows average around 42 degrees Fahrenheit. Sonora receives an average of 328 days of sun a year and 33 inches of rain during the wet season, January being the wettest month.⁹

Local Energy Efficiency Efforts

Electricity and propane are the two primary forms of energy used in the City. Electricity is distributed by PG&E and TPPA. Propane is supplied by several regional providers. Additionally, there is significant wood use as both primary and secondary heating fuel for some residents.

Sonora has already implemented programs that have resulted in or will lead to additional benefits in the form of energy efficiency, renewable energy, and water efficiency. Summarized below are activities and programs the City has initiated to meet their resource and energy efficiency goals:

Streamlined small residential rooftop solar energy systems permitting process

The city council has adopted by resolution a Water Efficient Landscapes Manual in order to implement state and local regulations. (12.33.040)

The City has opted-in to the PG&E streetlight retrofit program.

⁷ United States Census Bureau Fact Finder, Sonora City, CA. Accessed October 17, 2017.

https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

City of Sonora Demographics. Accessed October 17, 2017. <http://www.sonoraca.com/visitsonora/demographics.htm>

⁸ City Services. Accessed October 17, 2017. <https://www.sonoraca.com/cityservices/index.htm>

⁹ City of Sonora Demographics. Accessed October 17, 2017. <https://www.sonoraca.com/visitsonora/demographics.htm>

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Additionally, the City's General Plan has several goals, policies, and measures that specifically promote energy efficiency, water efficiency, and the expansion of renewable energy:

Table 1-5: City of Sonora General Plan Energy and Water Efficiency Components

**Housing
Element**

Encourage low-income homeowners or renters to apply for free energy audits and home weatherization by providing public information about the availability of energy-conservation programs and adding information to the city website regarding weatherization programs (General Plan Housing Element 3.C.9)

Continue to enforce state energy efficiency standards as provided for in Government Code Title 24, Part 6 (General Plan Housing Element 3.C.10)

Pursue implementing California Green Building Code or similar program for reuse and recycling of construction materials, pursue funding for loans for residential solar energy systems, encourage collection of rainwater and use of greywater systems, incorporate energy-saving features in conjunction with rehabilitation grants, and continue to support local agencies' efforts for improved in-home energy and conservation (General Plan Housing Element 3.C.13)

**Conservation
and Open
Spaces
Element**

Continue participation in the Tree City USA program to preserve the quantity, quality, and diversity of healthy trees in the region. (General Plan Conservation and Open Spaces Element, 4.C.f)

**Air Quality
Element**

Promote residential and commercial construction design that is energy efficient and maintains the area's air quality. (General Plan Air Quality Element 8.A.f)

Establish partnership with the Amador-Tuolumne Community Action Agency (ATCAA) and Energy providers to attain state and federal air quality standards by expanding the use of EPA certified heating devices and to replace or repair stoves in Sonora which do not meet air quality standards at the state and Federal Level. (General Plan Air Quality Element 8.A.g)
