

CHAPTER 4: IMPLEMENTATION PLAN

Chapter 4 outlines specific actions that can be taken to implement the strategies detailed in Chapter 3 and achieve the three EAP goals.

The implementation plan breaks the strategies into achievable steps and discrete actions, identifies if actions are specific to municipal agencies or the community at large, and lays out a timeline for completion of each action. The timeline for achievement of the actions outlined here is broken down into four years based on the priority and efficacy of the actions. Completion of actions should be tracked annually and the plan should be reevaluated for effectiveness at the end of the 4 year timeline. Through the Institute for Local Government's Beacon Program, SBC can assist the working group to track actions on an annual basis and evaluate their effectiveness. Finally, the implementation plan summarizes best practices in the energy action plan implementation field to provide context and additional guidance in achieving the goals of the EAP.

This chapter should be used to guide the actions that the City and community can take, when to take them, and how to take them, acknowledging any limitations related to capacity, availability of programs and assistance. Additionally, the most effective plans include guidance and measures for tracking progress. To best evaluate progress and effectiveness, it is recommended that the City periodically (at least every five years):

1. Track progress in all goal areas on actions taken
2. Re-evaluate overall community energy usage
3. Re-assess relevancy of goals

More information on how to track progress is included in the best practices section.

Finally, many national, state, and local organizations and programs offer tools and resources for becoming more energy and water resilient. Many of the programs available to the City of Sonora and other agencies are listed in detail in Appendices D-F. Partnership, training, networking, and funding opportunities may exist through many of these entities; the City should look into the available options to evaluate which resources would be most appropriate. To successfully improve energy and water efficiency in Sonora, the City, regional organizations, public agencies, and community members will need to work together to promote participation in existing local, state and federal programs.

IMPLEMENTATION TIMELINE

The Implementation Timeline identifies specific actions and steps the City and the Working Group can take to help the community achieve the 2035 goals. The timeline table prioritizes the actions by year based on staff resources, potential funding availability, and partner organizations' capacities. The timeline serves as a guidepost for City staff and Working Group members to initiate actions to implement the EAP and track progress. Rather than identifying week-by-week or month-by-month deadlines, the timeline merely identifies the actions that are best taken throughout each year to provide flexibility.

The implementation actions in the following table also address suggestions brought forth by community members during the June 12, 2017 community meeting. These include actions that promote wood smoke mitigation, involve the realty sector and transient occupants, and utilize biomass.

As previously indicated, it is optimal while implementing the goals and strategies outlined in this plan to follow the best practice recommended by the State of California, which is reduce the total amount of energy used through efficiency and conservation before switching to renewable energy sources to meet demand. As such, energy efficiency and educational measures are prioritized during the first and second year, and water efficiency and renewable energy measures are prioritized during the third and fourth year. It should also be emphasized that if switching energy systems (i.e. from gas to

electric), it is optimal to complete the fuel switching before buying new equipment – this way, all new systems are optimized for that fuel system. Following this priority ensures the most effective and affordable use of funding and resources.

Table 4-1 below is broken into two sections to highlight actions recommended for the City and the Working Group over the 4 year timeline.

Table 4-1: EAP Implementation Timeline

City Actions	
2018	<ul style="list-style-type: none"> □ Promote existing energy-efficiency, water-efficiency & renewable-energy programs and best practices by providing information when available at city offices and on the City website. (1.1, 3.1, 2.2) □ Develop a public recognition system for businesses that audit & retrofit their facilities. (1.1) □ Join Institute for Local Government’s Beacon Program in order to receive assistance in tracking community and municipal energy use and best practices (1.1, 1.3) □ Provide information regarding no-cost Title 24, Part 6 trainings for plans examiners, building inspectors, architects, designers, & contractors at city offices and on the City website. (1.2)
2019	<ul style="list-style-type: none"> □ Conduct building audits to benchmark energy and water use in facilities & identify cost-effective retrofit projects. (1.3, 3.1) □ Encourage new construction & renovation projects to participate in the no-cost Savings by Design program offered by PG&E. (1.2) □ Provide heat gain mitigation information when available for streets & parking lots (i.e. light-colored building & paving materials, landscaping, green roofs, shade trees & other green infrastructure). (1.1) □ Provide information when available on incentives, resources, trainings, & funding opportunities for achieving Title 24 ZNE goals. (1.2, 2.1)
2020	<ul style="list-style-type: none"> □ Retro-commission facilities to maximize energy performance & complete cost-effective retrofit projects. (1.3) □ Provide information when available on the benefits of incorporating renewable energy and storage systems into retrofit projects & new construction. (2.1) □ Consider adopting purchasing guidelines & energy-efficiency analysis requirements in RFPs. (1.3)

<p style="text-align: center; font-size: 24pt;">2021+</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Consider adopting on-site renewable energy at feasible City facilities. (2.2) <input type="checkbox"/> Encourage and participate in bulk purchasing of energy storage systems to support grid reliability and community resilience. (2.3) <input type="checkbox"/> Encourage broadband infrastructure in new development proposals to ensure optimal connectivity for IT controls & networks of operating systems. (2.3)
<p>Working Group Actions</p>	
<p style="text-align: center; font-size: 24pt;">2018</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Promote existing energy-efficiency, water-efficiency & renewable-energy programs and best practices through outreach events in the community. (All Strategies) <input type="checkbox"/> Assist Sonora schools in offering an educational energy event, curriculum, or workforce training. (1.1) <input type="checkbox"/> Assist ATCAA with a "weatherization blitz" targeting low income & older homes for upgrades. (1.1) <input type="checkbox"/> Encourage tenants & landlords to incorporate elements of energy efficiency in lease agreements. (1.1) <input type="checkbox"/> Identify funding for Tuolumne County Air Pollution Control District's wood stove rebate program & encourage residents to participate.(1.1) <input type="checkbox"/> Promote no-cost Title 24 trainings and resources available (1.2)
<p style="text-align: center; font-size: 24pt;">2019</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Partner with realtors to encourage homeowners and commercial property owners to audit and retrofit their homes and commercial buildings to increase selling prices, comfort, and energy performance. (1.1) <input type="checkbox"/> Encourage renters to collaborate with property owners on community renewable energy projects. (2.2) <input type="checkbox"/> Encourage property owners to consider projects that utilize renewable energy & incorporate storage. (2.2) <input type="checkbox"/> Encourage hotels and tourist organizations to educate visitors about water & energy efficiency. (1.1, 3.1) <input type="checkbox"/> Assist TUD & Sonora High School to coordinate a water wise student education program. (3.1) <input type="checkbox"/> Assist TUD to redesign water bills to reduce water waste, install demonstration gardens, develop new water-efficiency programs, & market programs. (3.1)

2020	<ul style="list-style-type: none"> <input type="checkbox"/> Partner with local organizations, other jurisdictions, & businesses to coordinate energy audits & for bulk purchasing of energy efficient equipment & appliances. (1.3) <input type="checkbox"/> Assist TUD to complete Leak Loss detections on agency water systems. Recommend completion of Leak Loss detection to other water system operators. (3.2) <input type="checkbox"/> Assist TUD to complete water audit and promote leak loss detection trainings for Tuolumne Utilities District staff. (3.2)
2021+	<ul style="list-style-type: none"> <input type="checkbox"/> Encourage businesses to participate in PG&E's Demand Response Program to reduce energy use during peak demand. (2.3) <input type="checkbox"/> Work with internet service providers to support and expand broadband infrastructure projects. (2.3) <input type="checkbox"/> Promote energy audits of potable water and wastewater systems. (3.3) <input type="checkbox"/> Assist TUD to implement cost-effective energy-efficiency projects of potable water and wastewater systems. (3.3)

IMPLEMENTATION BEST PRACTICES

The most successful strategies and actions incorporate elements of the following best practices: regular emissions inventories, public outreach, alignment with current industry standards, preparation for future industry changes, green infrastructure and smart growth community design, prioritization of low-cost and high-impact measures, cross-sectoral and interjurisdictional partnership, and adoption and/or promotion of creative financing programs.

REGULAR EMISSIONS INVENTORIES

Community-wide emissions inventories provide the best indication of the overall effectiveness of the plan, although it will be important to reconcile actual growth in the City versus the growth projected in the forecasts developed for the EAP. Conducting these inventories periodically, instead of annually, will allow direct comparison to the 2010 baseline while lessening the impact on staff resources. It is recommended that inventories are completed at least every 5 years in order to monitor the effect of the EAP and adapt the strategies and actions to reach the identified goals.

It will be important to understand the effectiveness of each strategy in order to prioritize future actions. Evaluating strategy performance will require data on community participation rates and the associated energy savings. With the support from PG&E, the City should coordinate strategy evaluation on the same schedule as the community-wide inventories and summarize progress towards meeting the identified performance targets. For the EAP to remain relevant, the City should be prepared to evaluate and revise the actions and approach to strategies over time. It is likely that new information, technology and programs will emerge; therefore, the City must be ready to take advantage of these opportunities. Additionally, the City should track progress on an annual basis through participation in the Institute for Local Government's Beacon Program.

PUBLIC OUTREACH

The greatest barriers to energy efficiency upgrades are lack of information about efficiency practices and scarcity of low-interest financing to offset initial costs. The Working Group can promote existing energy efficiency programs, and collaborate on activities such as hosting an energy fair event, or creating new outreach campaigns that encourage people to make energy-efficiency improvements within their living and work environments. Moreover, encouraging the community to reduce

energy use during peak load periods can ensure that energy needs are met even in times of emergency, as in extreme heat conditions. Conservation tips for reducing peak load include: setting thermostats at 78° or higher and turning them off when away, cooling with fans and drawing drapes during hot summer days, turning off unnecessary lights and appliances, and using major appliances in the morning or late evening.

The CivicSpark fellow can provide support to the City with public outreach, facilitation of the Working Group, and preparation of materials and resources for presentation at City offices and the City's website. The City website should include information and resources on energy efficiency best practices, links to current rebate, finance and incentive programs, the Tuolumne County Air Pollution Control District's woodstove rebate program when it becomes available, and case studies of cost-effective energy efficiency improvements. The City website should also house information developed by the Working Group to mark progress made with implementation of the plan and keep the community engaged and aware.

The City should also link to resources and tools available for making informed decisions on renewable energy, financing options, and the permitting process. PG&E offers customers an opportunity to participate in a Community Solar program in which they can utilize renewable energy if they lack the capacity to support renewable infrastructure. The Working Group should work with utilities, community organizations and local banks to expand and promote available renewable energy financing programs – many of which can be found on California's Go Green Financing website. Additionally, there are new financing mechanisms such as power purchase agreements, solar leases and Property Assessed Clean Energy (PACE) financing options available where property owners can receive the benefits of solar power with little to no upfront costs. The federal renewable energy tax credit provides homeowners and commercial property owners with a tax credit for 30% of qualified expenditures through 2019 and then stepping down to 26% in 2020, 22% in 2021, and 10% after 2022.

Finally, the City should lead and encourage the community by exemplifying best practices in energy efficiency, renewable energy, and water efficiency in all of its operations and buildings. For example, the City can install solar arrays on or over parking lots, invest in energy efficient appliances, and maintain water-efficient landscaping in areas managed by the City to serve as public demonstration areas. Additionally, demonstrations of rainwater catchment or greywater systems should be available to homeowners to promote local onsite water reuse.

TITLE 24 PART 6 – BUILDING ENERGY EFFICIENCY STANDARDS

The 2016 update to the Title 24 Green Building (Part 11) and Energy Efficiency Standards (Part 6) help make new construction significantly more energy efficient. The 2016 Energy Efficiency Standards are expected to be 28% more efficient than previous standards for residential construction according to the California Energy Commission. The California Green Building Standards Code (CALGreen) includes mandatory and voluntary green building measures that make buildings healthier, more comfortable, and more energy- and water-efficient. Architects, designers, contractors, developers and building inspectors with a strong understanding of the standards can help projects achieve higher efficiencies.

The City should provide information from Energy Code Ace, which offers free tools, trainings and resources on Title 24, Part 6 to assist the building industry, related stakeholders, and the public in complying with the 2016 Building Energy Efficiency Standards. The Working Group, along with support from the CivicSpark fellow, should partner with local contractor associations and related building industry groups to provide opportunities for the building workforce to attend Title 24 energy efficiency and green building trainings.

HIGH PERFORMANCE & GREEN BUILDING EDUCATION AND RECOGNITION

In 2019, the California building code will be updated to require Zero Net Energy (ZNE) compliance in all new single-family residential construction after January 1st 2020 (and looking beyond, the goal is for all new commercial construction to be ZNE by January 1st 2030). In order to assist the local building industry with compliance, it is essential that the City provide resources to contractors as the code updates occur. The City should provide information through their website and directly to contractors and developers at the plan check counter on available incentives and education resources related to energy

efficiency and green building. The City should look into the feasibility of providing recognition or awards for buildings that exceed the current Title 24 Energy Efficiency Standards or achieve green building certification, such as LEED Building Certifications.

Providing incentives for energy-efficient and green buildings, such as priority permit review, encourages developers to explore incorporating energy-efficient and green-building features into their projects, which can save the property owners and tenants money over the life of the building, improve the health of tenants and increase the value of buildings. Reduced permitting time can be an effective incentive because it can translate to significant savings for developers that are paying interest on construction or bridge loans during the permit approval process. Recognition by the City can also be an effective incentive for developers to pursue green building certification or exceed the Energy Efficiency Standards. According to the Appraisal Institute¹, green building certifications significantly increase the value of buildings through improved rental income, higher occupancy, lower operating costs, and lower risks.

STREETLIGHTS

Upgrading streetlights is one of the easiest, most cost-effective energy efficiency actions a municipality can take. The City of Sonora has already begun this process, and the city streetlight upgrade is an on-going project. In 2010, the City used 266,352 kWh for public lighting. Typically, traditional street lights can be upgraded to LEDs and achieve savings between 50-70% of energy use – which could equate to more than 130,000 kWh saved in Sonora.

Replacing traditional street lights to energy efficient LEDs greatly reduces electricity and maintenance costs while improving light quality, night visibility and reducing urban night glow. The City has opted in to PG&E's retrofit program for full turnkey LED replacement services for PG&E owned and operated street lights. For street lighting that are not owned or operated by PG&E, the City may be offered incentives for a lower rate change and LED replacement.

ZERO NET ENERGY

To make compliance with the above discussed changes in California's building and energy code easier, the City and Working Group should incorporate zero net energy (ZNE) incentives and resources into the local design and building networks outreach. ZNE buildings are achieved by first developing an integrated design approach which considers systems and incorporates multiple strategies to decrease energy use and increase comfort, such as a well-insulated building shell. Highly energy-efficient technologies including HVAC, lighting and controls equipment should then be applied along with metering equipment. The building should then be optimized for the way it will be used and operated. Finally, renewable energy generation systems should be installed to meet the remaining energy needs of the building.

To make the ZNE design process easier, more efficient, and more affordable, the City and Working Group should encourage ZNE through actions such as: (1) remove barriers that hinder ZNE development and streamline permitting; (2) partner with organizations that can provide ZNE resources, trainings and assistance for planning and building staff, designers, and building contractors; (3) evaluate strategies to expand renewable systems through American Solar Transformation Initiative (ASTI)² and other DOE programs; (4) evaluate the potential for residential and non-residential sectors of the City to incorporate renewable energy; (5) create an awards-based recognition for achieving ZNE; and finally (6) the City should

¹ Green Building Resources. The Appraisal Institute. Accessed September 22, 2017. <http://www.appraisalinstitute.org/education/education-resources/green-building-resources/>

² The nationwide ASTI program is a collaborative initiative to increase solar adoption by agencies and utilities throughout the nation by targeting market conditions. The program is part of the U.S. Department of Energy's Rooftop Solar Challenge and Sunshot Initiative.

encourage building electrification and ultra-low energy performance design protocols, such as the following steps promoted by the American Council for an Energy Efficient Economy (ACEEE) ³.

Table 4-2: Ultra – low energy performance in existing buildings: Design Steps and Sample Technology Options

Design Step	Sample Technology Options
1. Reduce building energy loads with improved envelopes & the use of passive systems.	Superinsulation, daylighting, exterior shading, natural ventilation
2. Install high-efficiency systems to address primary building energy loads.	Heating, ventilation, air-conditioning systems (including distribution), water heating, appliances/equipment
3. Install systems to manage building energy loads with effective control strategies & other mechanisms.	Energy management systems, plug-load control strategies, feedback to users & occupants
4. Incorporate energy recovery mechanisms to minimize energy losses.	Energy recovery ventilation, heat-pump water heaters
5. Use renewables to meet remaining building loads.	Rooftop & other photovoltaic systems
6. Monitor & manage post-occupancy building energy use.	Monitoring-based commissioning, occupant engagement

Green Infrastructure and Heat Gain

Incorporating natural design elements into overall community design can have a large effect on energy use in surrounding buildings, especially in higher density areas. Trees, shade structures, and cool (high albedo) paving and roofing materials reduce the amount of solar energy absorbed as well as the temperature of rooftops and parking lots. By increasing the use of these materials it is possible to reduce heat gain in residential buildings and commercial centers during warm summer months. The decrease in ambient air temperatures and reduced heat gain in warm summer months can reduce the amount of energy required for air conditioning. It is also possible to optimize heat gain in the winter through smart landscaping, passive solar design, and other community design measures; these can offset heating costs and speed the melting of snow and ice on roadways, sidewalks, and parking lots.

The City can optimize these effects by providing information on the benefits of reducing cooling loads during summer months and optimizing heat gain in winter months. Examples include land use and new construction requirements, such as tree standards for existing streets and parking lots, heat gain mitigation requirements for new parking lots (through the use of

³ American Council for an Energy-Efficient Economy, Unlocking Ultra-Low Energy Performance in Existing Buildings. – Accessed September 22, 2017. <http://eecoordinator.info/wp-content/uploads/2017/08/Unlocking-Ultra-Low-Energy-Performance-in-Existing-Buildings.pdf>

shade structures, trees or cool pavement, etc.), and cool roofing requirements for new construction. Large shade structures can also accommodate solar panels, thus serving a dual purpose and creating a co-benefit for the community.

CROSS-SECTORAL AND INTER-JURISDICTIONAL PARTNERSHIP

Often in rural areas, a huge barrier to implementation of energy strategies is large up-front capital investment and long travel distances for shipping and industry professionals. One way to mitigate these costs is to foster partnership opportunities with other public and private entities interested in similar energy projects. For instance, partnering with multiple organizations to schedule free energy audits from the local utility will make it much more feasible for the utility to send out an audit team. Moreover, bulk purchasing of solar panels, LED lights, and other high-cost energy efficient appliances and systems can cut costs by a large margin.

The Working Group can facilitate the partnerships between public agencies and special districts in Sonora that are not under the jurisdiction of the City to reach the broader public that these agencies serve. For example, assisting the school district with the development of an energy efficiency education program, which can include educational presentations, hands-on learning activities, and energy fair events.

The Working Group should also partner with TPPA, PG&E, and the Sierra Nevada Energy Watch (SNEW) program to target businesses and special districts to encourage energy-efficiency projects. The program outreach should target specific commercial sectors including restaurants, supermarkets, retail, office, and manufacturing. The information should provide useful energy and cost saving recommendations. The outreach program should encourage residents and businesses to conduct energy use benchmarking, perform building energy audits, and implement cost-effective, energy-efficiency projects.

FINANCING AND ALTERNATIVE FUNDING PROGRAMS

The up-front costs of energy-efficiency improvements can be a considerable barrier for many homeowners and businesses. According to the online survey, 55% of respondents noted cost as their greatest obstacle to completing projects. However there are numerous options to address this challenge, including on-bill financing, low-interest loans, and Property Assessed Clean Energy (PACE) programs.

One example, on-bill financing, works in conjunction with a utility's energy-efficiency rebate and incentive programs to eliminate upfront costs. The cost of energy-efficiency retrofits is amortized on a property's monthly energy bills. The program helps eligible customers pay for energy efficient retrofit projects with zero-interest, zero-penalty loans. Loan payments are included on the customer's monthly utility bills and are set to not exceed the energy savings (in dollars) realized from the energy-efficiency retrofit.

PACE programs are financing tools that allow residential and non-residential property owners to receive financing for energy-efficiency, clean-energy and water-efficiency projects, which are repaid through a voluntary special assessment on property tax bills. There are several organizations in California that provide access to PACE financing programs at no cost to local governments. By opting into multiple programs, the City can help establish a competitive marketplace for PACE financing.

Other examples of creative funding and financing include crowdfunding, feed-in-tariffs, limited liability corporations (LLC's), on-bill financing, revolving loan funds, power purchase agreements and virtual ownership. The City should partner with utilities, community organizations and local banks to identify and promote existing and potential funding and financing

programs through email notices, mailers, public events, and the City's website. Additional funding and financing resources are highlighted in Appendix F.

THE PATH TO SUCCESS

Achieving the goals of the EAP will require collective action by the City, public agencies, residents and business owners. While there are significant costs associated with energy efficiency, renewable energy, and water efficiency projects, the long term savings and co-benefits to the community greatly outweigh the costs. Additionally, upfront costs can be deferred through financing and incentive programs that can make projects cash flow positive from day one.

In order to complete the actions in the Implementation Plan, it is recommended that the City designate a community Working Group to complete the implementation actions designated for the Working Group. The Working Group should be comprised of representatives from the City, Tuolumne County, Tuolumne Utilities District, Tuolumne County Resource Conservation District, Sonora School District, Amador Tuolumne Community Action Agency, Tuolumne County Association of Realtors, the business community, and residents.

The City has opted to take part in the Local Government Commission's CivicSpark AmeriCorps program and will receive assistance on implementation from a CivicSpark fellow through August 2018. The CivicSpark fellow will be able to coordinate the working group, provide capacity for City staff to complete implementation actions, and connect the City with outside agencies and regional organizations to leverage existing activities to assist with implementation.