City of Jackson

Energy Action Plan

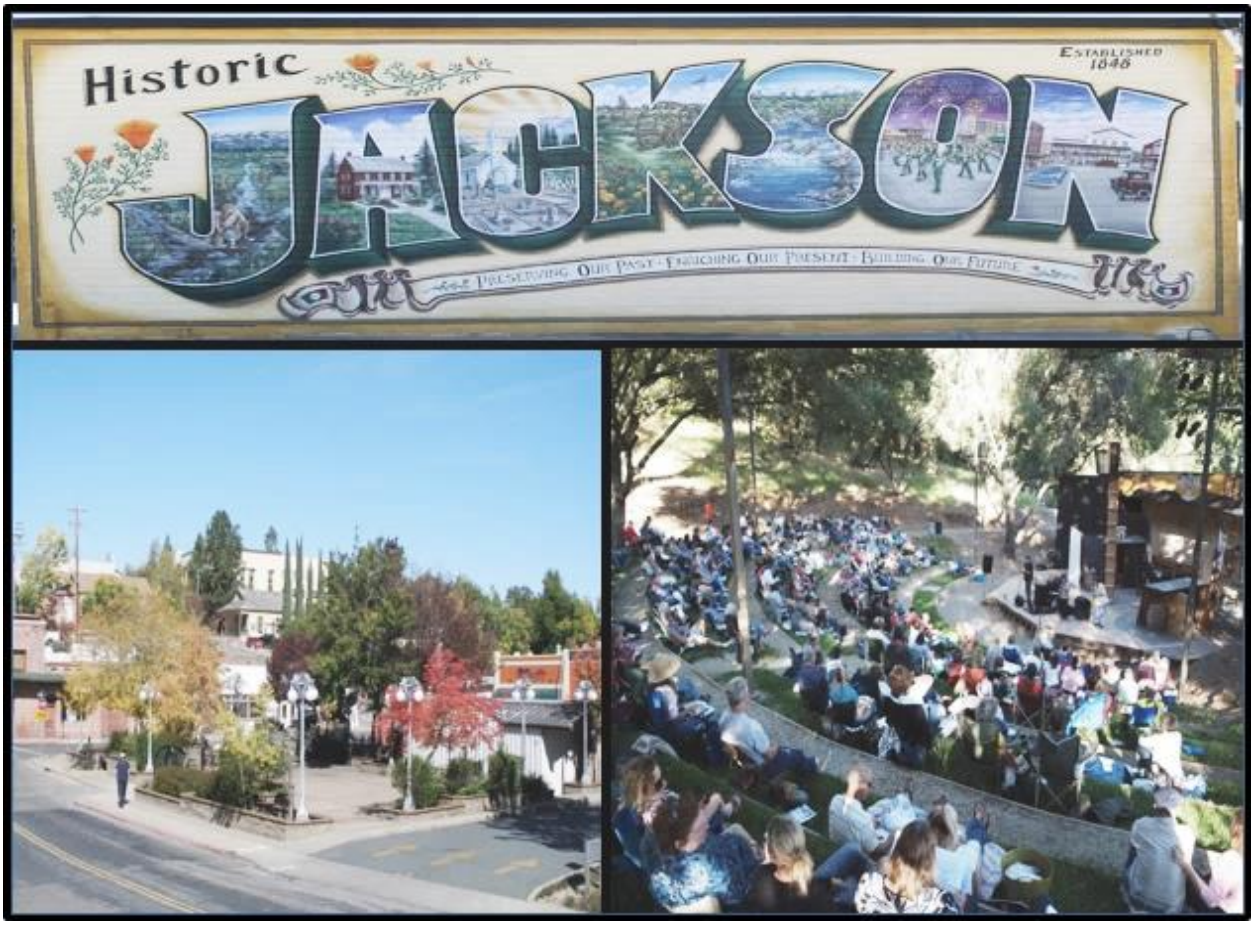

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Table of Contents

EXECUTIVE SUMMARY 1

CHAPTER 1: BACKGROUND 3
Community Profile 3
Local Energy Efficiency Efforts 3

CHAPTER 2: INTRODUCTION 5
WHY PREPARE AN ENERGY ACTION PLAN? 5
Climate Science Basics 5
Local Climate Change Impacts 6
Regulatory Context 6
Economic Opportunities 7
Relationship to CEQA 8
ENERGY ACTION PLAN DEVELOPMENT 8
Process 8
Public Outreach 9
USERS GUIDE TO THE REPORT 9

CHAPTER 3: BASELINE INVENTORY AND FORECAST 11
2005 Baseline Community-Wide Inventory 11
2020 Business-as-Usual Community-Wide Forecast 11
2005 Baseline Municipal Operations Inventory 12

CHAPTER 4: GOALS, STRATEGIES, AND ACTIONS 14
DEFINITION OF KEY TERMS 14
BASIS FOR ENERGY GOALS AND STRATEGIES 15
ENERGY REDUCTION POTENTIAL 15
ENERGY COSTS AND SAVINGS 16
ENERGY EFFICIENCY STRATEGIES POTENTIAL ENERGY SAVINGS 17
ENERGY EFFICIENCY GOALS, STRATEGIES AND ACTIONS 18

CHAPTER 5: IMPLEMENTATION 33
IMPLEMENTATION PROGRAM 33
FUNDING SOURCES AND FINANCING MECHANISMS 35
U.S. Department of Energy 35
California Energy Commission 35
California Infrastructure and Economic Development Bank 35
California Statewide Communities Development Authority 36

Pacific Gas and Electric Company 36

APPENDIX A: JACKSON BASELINE ENERGY USE 37

APPENDIX B: JACKSON BUSINESS AS USUAL ENERGY USE FORECAST 39

APPENDIX C: POTENTIAL ENERGY REDUCTION CALCULATIONS 41

APPENDIX D: EXISTING ENERGY EFFICIENCY PROGRAMS, POLICIES AND CODES IN JACKSON…. 49

APPENDIX E: PG&E AND OTHER ENERGY EFFICIENCY PROGRAMS 51

APPENDIX F: ENERGY EFFICIENCY FINANCING PROGRAMS 54

APPENDIX G: PUBLIC OUTREACH 56

Table of Figures

Summary of Potential 2020 Annual Energy and Cost Savings 2

Comparison of 2005 Baseline and 2020 Forecasted Annual Energy Use with and without the EAP 2

Energy Action Plan – Content and Organization 10

Baseline and BAU Forecast of Residential and Non-Residential Electricity and Natural Gas Use 12

2005 Baseline Municipal Facilities Electricity Consumption (kWh) 12

2005 Baseline Municipal Facilities Natural Gas Consumption (therms) 13

Summary of Potential 2020 Annual Energy Savings 17

EAP Implementation Matrix 34

Table A-1: Jackson 2005 Baseline Residential Energy Use by Energy Source 37

Table A-2: Jackson 2005 Baseline Non-Residential Energy Use by Energy Source 37

Table A-3: Jackson 2005 Baseline Municipal Buildings Energy Use by Energy Source 38

Table A-4: Jackson 2005 Baseline Public Lighting Energy Use by Energy Source 38

Table A-5: Jackson 2005 Baseline Potable Water and Wastewater Energy Use by Energy Source 38

Table B-1: BAU Residential Energy Use Forecast by Energy Source 39

Table B-2: BAU Non-Residential Energy Use Forecast by Energy Source 39

Table B-3: Clear Path California BAU Energy Use Forecast Annualized Growth Rates 40

Table B-4: BAU Residential Energy Use Forecast Growth Indicators and Annualized Growth Rates 40

Comments from Joint Study Session 1: August 19, 2014 56

Comments from Joint Study Session 2: November 12, 2014 57

EXECUTIVE SUMMARY

The Jackson Energy Action Plan is a roadmap for expanding energy-efficiency and renewable-energy efforts already underway in the City of Jackson (the City). It builds upon energy-efficiency efforts begun in 2010 and work conducted by Sierra Business Council (SBC) in 2010-2012 and 2014. The document focuses on three energy use sectors within the community – residential, non-residential and municipal (which is a subset of non-residential). The report only evaluates energy consumed by buildings and municipal operations; other energy consuming sectors such as transportation, solid waste, etc. are not addressed but could be at a future date. The City of Jackson owns and operates its own law enforcement and fire protection agencies, some of the water distribution system, the wastewater treatment plant and collection system, some of the public lighting, city parks, city office buildings and staffs the building department. The City retains outside consultants to staff the planning and engineering departments.

The two primary energy sources consumed by the three community sectors are electricity and natural gas which is distributed by Pacific Gas and Electric Company (PG&E). Additionally, there is relatively minor propane and other non-utility fuel use in Jackson which was not analyzed due to data limitations. According to the baseline inventory conducted for Year 2005 the community consumed 45.6 million kilowatt hours (kWhs) of electricity and 1.5 million therms of natural gas. Municipal operations accounted for 1.1 million kWhs of electricity consumption in 2005 and cost the City $172,305. The forecast for Year 2020 shows a 10% increase in residential electricity and natural gas use; the community's non-residential electricity and natural gas use is forecasted to stay flat by 2020 because there is no anticipated non-residential growth within the City limits. To date the City's energy efficiency efforts are saving over 5.3 million kWhs of electricity and 19,976 therms of natural gas annually, which underscores the importance of having such measures.[1] The inventory and forecast work conducted by SBC identifies additional areas where significant opportunities exist for additional energy savings. The EAP specifies the actions needed to achieve those savings resulting in further reductions in energy consumption and increased energy savings for residents, businesses and the local municipal government.

The document is organized into five chapters; the 'heart' of the document is contained in Chapters 4 and 5 (Energy Efficiency Goals, Strategies and Actions, and Implementation). The goals address five key areas:

- Energy efficiency in existing structures
- Energy performance in new construction
- Expansion of renewable energy options
- Energy efficiency in municipal operations
- Water conservation which reduces energy needed to transport and treat water

The strategies focus on voluntary measures that can be taken by residents, businesses and the local government. Key components include developing and disseminating information on existing rebate and incentive programs; public outreach via the City's website and printed materials; training for

[1] Jackson residential and non-residential energy savings based on projects completed 2006-2012. Source: PG&E

staff, contractors and developers; and partnerships with PG&E and local and regional organizations. Energy reduction performance indicators and targets are established for each group of strategies. If all the actions are implemented, the EAP would reduce electrical energy used in 2020 by 18% and natural gas use by 4%. The estimated energy and cost savings for each strategy area would be as follows:

Summary of Potential 2020 Annual Energy and Cost Savings

Strategy Area	2020 Annual Energy Savings		2020 Annual Cost Savings	
	kWh	Therms	Electricity[2]	Natural Gas[3]
Existing Structures	2,736,798	45,002	$ 694,052	$ 157,509
New Construction	131,983	5,826	$ 33,471	$ 20,392
Renewable Energy	5,417,262	3,486	$ 1,373,817	$ 12,200
Municipal Operations	232,762	1,843	$ 59,028	6,452
Water Conservation	23,858	--	$ 6,050	--
Total	8,542,663	56,157	2,166,418	196,553

The following table compares 2005 Baseline energy usage, 2020 Business as Usual (BAU) usage and potential energy use savings in 2020 with the Energy Action Plan (EAP).

Comparison of 2005 Baseline and 2020 Forecasted Annual Energy Use with and without the EAP

Energy Use	2005 Baseline	2020 BAU without the EAP	2020 with the EAP	Percent Difference
Electricity	45,613,299 kWh	47,037,634 kWh	38,494,971 kWh (-8,542,663 kWh)	18% reduction from 2020 BAU
Natural Gas	1,500,090 Therms	1,582,550 Therms	1,526,393 Therms (-56,157 Therms)	4% reduction from 2020 BAU

Purpose of the Jackson Energy Action Plan

The EAP can be used by local residents and business owners to see where they might achieve greater energy efficiency in their home or commercial building. The local municipal government can use it to guide decisions about how to make the City's building and operational infrastructure more energy efficient. It can also be used by City staff to prioritize programs to inform, encourage and inspire residents and businesses owners to be more energy efficient now and in the future. Exploring and implementing energy-efficiency programs creates flexibility for the City in meeting its energy demand. This in turn helps the community be more self-sufficient and economically resilient in light of probable future increases in energy prices, whether due to market conditions or the regulatory environment. Being energy efficient does not compromise the City's historic small town character but rather enhances its ability to respond to the ever changing external conditions related to energy supply and demand.

[2]Assumed average rate of $0.2536 per kWh based on Forecast of PG&E Rates. http://www.ci.healdsburg.ca.us/Modules/ShowDocument.aspx?documentid=8906

[3] Assumed average rate of $3.5 per therm based on extrapolation from PG&E 2015 natural gas forecast. http://www.pge.com/tariffs/rateinfo.shtml

CHAPTER 1: BACKGROUND

Community Profile

The City of Jackson is the county seat of Amador County and a registered California historical landmark (118). Established in 1848 and incorporated in 1905, its motto is "Preserving our past, enriching our present, building our future." The city covers 3.7 square miles and is traversed by State highways 49 and 88. In 2014 the City was home to approximately 4,545 residents living in 2,317 households with an average household size of 2.0. In 2014, the City had 30 full time, 9 part time and 3 contract employees and an operating budget of $3.4 million. The City operates its own law enforcement, fire protection, water delivery, wastewater treatment, parks, some pubic lighting and city office buildings. Electricity and natural gas for the community is distributed by Pacific Gas and Electric Company (PG&E).

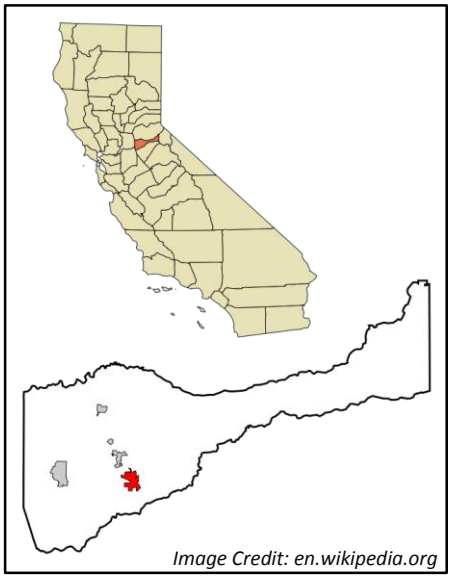


Image Credit: en.wikipedia.org

The climate in Jackson reflects its location in the Sierra Nevada foothills. Average temperatures range from summer highs in the 90's (Fahrenheit) to winter lows in the mid-30's with record highs in the 110's and record lows in the mid 10's.

Local Energy Efficiency Efforts

Summarized below are activities and programs the City has undertaken to promote a leadership position toward being more energy efficient. For a full description of programs and activities, refer to Appendix D.

- Lead-by-example energy-use reduction projects to reduce government operations emissions, including new high-efficiency HVAC units and lighting[4]
- Lead-by-example paper recycling (and waste reduction) program
- Lead-by-example replacement of fleet vehicles with higher efficiency models
- Lead-by-example flexible scheduling to manage travel and reduce transportation emissions
- Transportation improvements plan which includes seeking funding for construction of new sidewalks around the downtown to encourage pedestrian commuting
- Working with a local advocate to have more Neighborhood Electric Vehicles (NEV) lanes
- Researching grant opportunities to have charging stations installed in municipal parking lots

The Jackson General Plan supports energy efficiency in the following ways:

- Solar access and orientation in new construction (2011 Architectural Regulations, pp. 2-5, 2-7,)

[4] In 2003 the City replaced the HVAC units with high-efficiency HVAC units. In 2008/2009 all ballasts and tubes were replaced in all City facilities and incandescent bulbs were swapped out with LED bulbs at the City's Civic Center.

- Energy-efficiency timers on lighting for large retail establishments (2011 Architectural Regulations, 9.9.10, p. 22)
- Use of indigenous drought tolerant species in landscaping (2011 Architectural Regulations, 9.9.10(h), p.22)
- Energy reduction in new housing through implementation of Title 24 energy efficiency standard (2012 Housing Element, p. 66)
- Promote energy saving programs via continued partnership with PG&E (2012 Housing Element, p. 66)
- Continued implementation of the Resource Constraints and Priority Allocation Ordinance which promotes reduction of energy use through new housing development amenities (2012 Housing Element, p. 66)

The 2014 Jackson Municipal Code has several sections that promote energy efficiency:

- Solar orientation, solar collectors, solar access in new development (17.30.140)
- Street trees for shade in residential and non-residential development (17.40.050)

CHAPTER 2: INTRODUCTION

This chapter discusses the purpose and scope for the Jackson Energy Action Plan (EAP), the regulatory context for energy efficiency planning, how the EAP was developed, and provides a user's guide to the document.

WHY PREPARE AN ENERGY ACTION PLAN?

Image Credit: en.wikipedia.org

Local economies in the Sierra Nevada rely heavily on natural resources for tourism, recreation, forestry, agriculture and other industries. Changes in weather patterns resulting in less precipitation and significantly warmer temperatures have the potential to adversely affect the vitality of the region's natural resources, which in turn directly impacts local business. Reducing a community's demand on the energy grid helps lighten the need for new energy generating plants and creates the flexibility for the community to more readily meet its energy needs with locally produced renewable energy. Retrofitting homes and businesses to be more efficient creates local jobs, reduces energy costs, improves air quality, and in combination with increased opportunities for walking and bicycling, improves community members' health. In addition, money not spent on energy can instead be spent at local businesses, improving the local economy.

The Jackson EAP outlines a series of strategies to reduce energy consumption in residential and non-residential buildings as well as municipal facilities and operations. This report is intended to provide guidance to City staff, demonstrate the City's commitment to energy efficiency and inspire residents and businesses to participate in community efforts to maximize energy efficiency and reduce the associated air quality impacts of fossil fuel based electricity.

Climate Science Basics

Naturally occurring gases[5] 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.

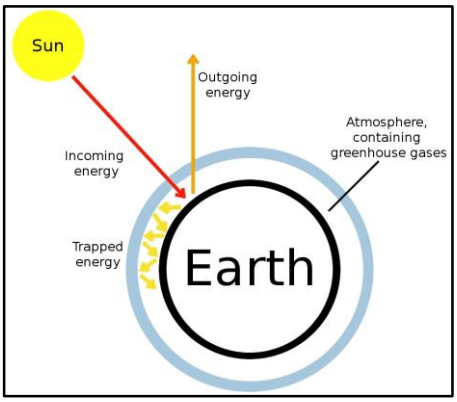


Image Credit: simpleclimate.wordpress.com

[5] The primary GHG's in the earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide and ozone.

Scientific studies suggest that human activities are accelerating the concentration of greenhouse gases (GHGs), 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.[6]

Local Climate Change Impacts

The City of Jackson, like all foothill communities in the Sierra Nevada, faces challenges associated with climate change in the region. 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 Jackson, and ultimately impact quality of life for community members.

Regulatory Context

California is a leader in developing policies to reduce GHG emissions, and these policies are some of the drivers behind the completion of GHG inventories and energy efficiency planning at the local level. The state's key efforts are described on the following page.

[6] Based on IPCC, 2007: 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.

1978	• **Title 24, Part 6.** Energy Efficiency Standards first adopted in 1978. Ongoing updates. Established minimum energy efficiency performance standards for residential and nonresidential buildings. Effective July 2014 new energy efficiency construction standards cost-effectively increase efficiency by 20% for residential buildings and 25% for non-residential buildings.
2002	• **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	• **Executive Order S3-05.** 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	• **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	• **Senate Bill 97.** Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act.
2008	• **Senate Bill 375.** Requires the California Air Resources Board to establish GHG reduction targets for each Metropolitan Planning Organization (MPO) in California and directs each MPO to develop a Sustainable Communities Strategy.
2011	• **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.

Economic Opportunities

One of the potential outcomes of implementing the Jackson EAP is increased investment in local green businesses and technologies which could provide new economic development opportunities for the City. The following indicators suggest a robust market for clean economy businesses and industries as we move forward to the next decade.[7] New clean economy jobs and business opportunities range from water efficiency and recycling to energy and battery technologies as well as the transformation of existing industries. All of this creates new economic opportunities for communities within the Sierra Nevada region.

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

[7] 2014 California Green Innovation Index, 6th Edition. Next 10. www.next10.org http://greeninnovationindex.org/sites/greeninnovationindex.radicaldesigns.org/files/2014-Green-Innovation-Index.pdf. p. 29, 33-44

- Jobs within California's Core Clean Economy 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 Jackson determined the EAP was categorically 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.*

Information in the document (and related background reports) can be used in environmental assessments required for new development projects, thus expediting the project review process.

ENERGY ACTION PLAN DEVELOPMENT

Process

Photo Credit: en.wikipedia.org

The path to the EAP began in 2010 when the City engaged Sierra Business Council (SBC) to conduct a GHG inventory of municipal facilities and then subsequently, in 2011, to conduct a GHG inventory for the community, including residential and non-residential sectors. Energy consumption data was gathered for baseline year 2005 (which is the recommended year due to data availability). Calculations were performed to estimate baseline emissions (based on Year 2005 energy consumption data) using the most current methodology and protocols at the time. [8] The baseline inventories were presented to the City Council in February 2011 and April 2012.

[8] The municipal inventory followed the Local Government Operations Protocol and the community inventory followed the International Local Government Greenhouse Gas Emissions Analysis Protocol. As part of the EAP process the City's community emissions were updated to meet the recently released United States Community Protocol, the new national standard.

In 2013, the City decided to take the information gathered through the baseline inventory process and formulate energy strategies that would assist the community in being more energy efficient now and in the future.

In 2014, the baseline inventory data was forecasted out to 2020 using local and regional growth projections. The data gathered during the inventory and forecasting process helped identify those activities within the community that consumed the most energy (and correspondingly had the highest GHG emissions). This information pointed the way to where the greatest energy efficiencies could be realized, resulting in a series of goals, strategies and actions the City can undertake to reduce energy consumption as well as dollars spent on energy. Performance indicators and targets were identified, where appropriate, to be used by the City to measure its progress toward achieving greater energy efficiency.

Public Outreach

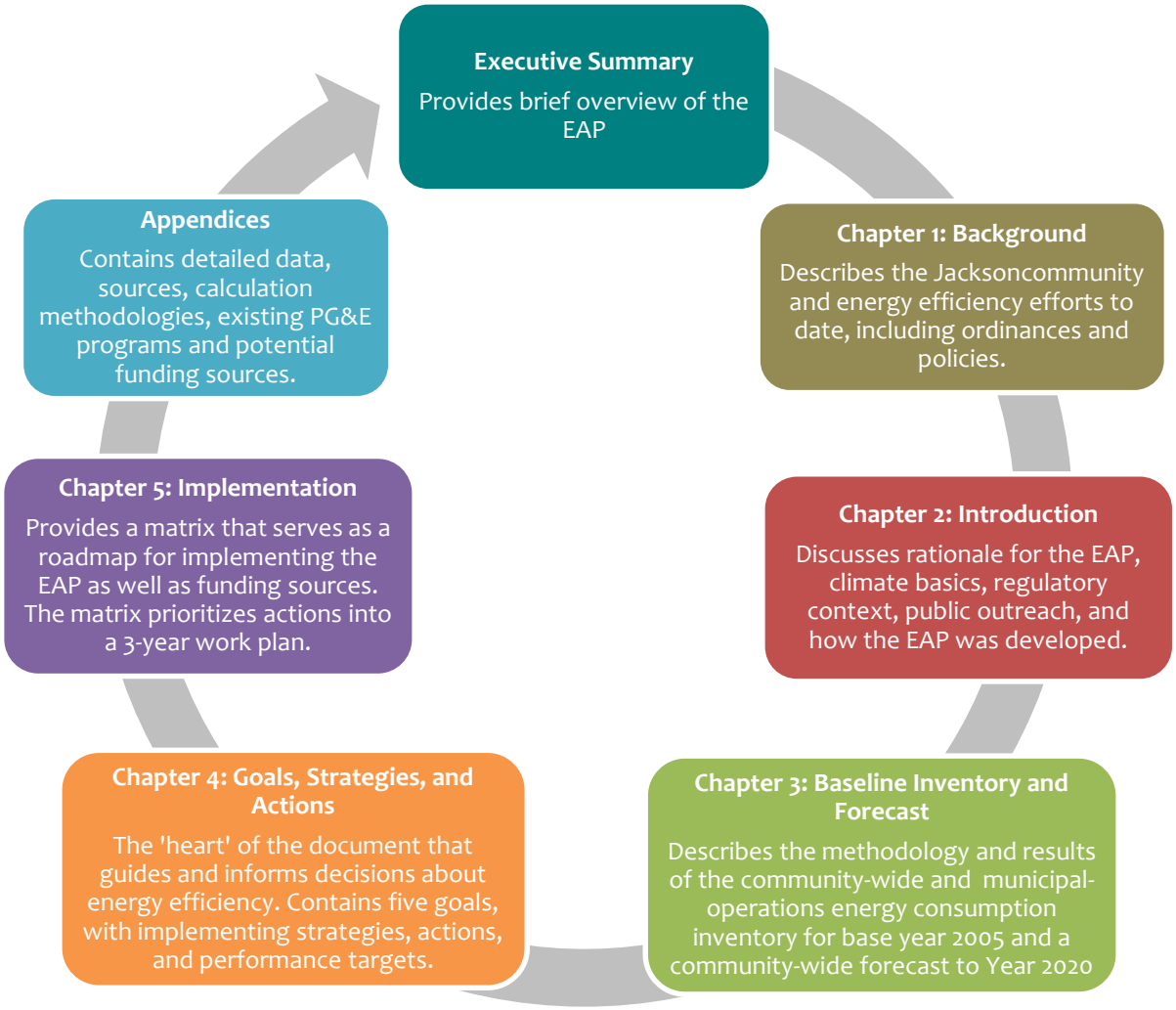
As with any local planning process, community involvement is an essential part of its success. For the EAP, input was widely sought within the City to help shape its content and ensure the document is relevant and realistic. The public outreach strategy included an online survey, information on the City's website, two community study sessions, meeting notices in local newspapers, targeted outreach to local businesses and organizations, and duly noticed public meetings before the Planning Commission and City Council on February 17 and February 23, 2015 respectively. [9]

USERS GUIDE TO THE REPORT

The EAP can be used as a tool to guide municipal and community decisions about the best ways to improve energy efficiency in the home, business, and municipal facilities and operations. It is designed as an integrated 'living' document that can be modified and augmented as new information, programs and energy efficiency technologies become available. The following diagram describes the information contained in the five chapters and appendices of the EAP. It provides 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.

[9] Dates to be filled in once meetings have occurred

Energy Action Plan – Content and Organization



CHAPTER 3: BASELINE INVENTORY AND FORECAST

This chapter summarizes the 2005 baseline and 2020 forecast of community-wide energy consumption as well as the 2005 baseline of municipal-operations energy consumption. SBC previously worked with the City of Jackson to conduct 2005 baseline GHG emissions inventories of the City's municipal operations and community-wide activities and sources. These inventories were conducted from 2010-2012, with support from PG&E. The baseline and forecasted energy consumption informed the strategies for reducing energy consumption and increasing energy efficiency discussed in Chapter 4. It also provides a baseline year against which future progress can be measured.

2005 Baseline Community-Wide Inventory

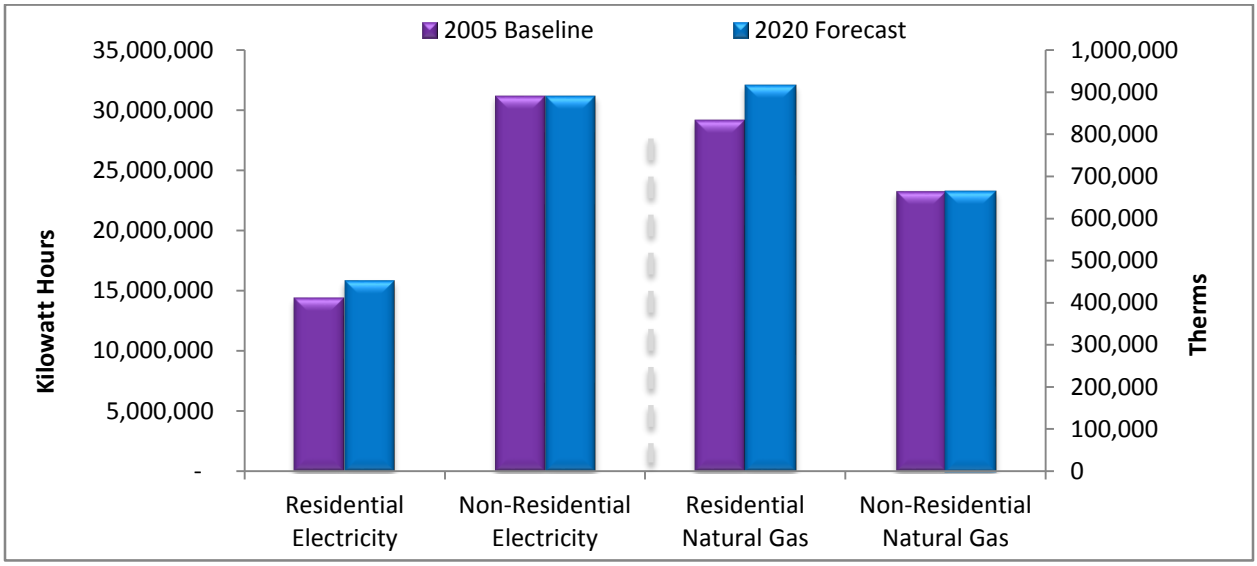
The City of Jackson's community-wide energy consumption data is expressed as aggregated residential and non-residential energy consumption by energy source. The City's municipal electricity use is included with the community-wide energy usage. Electricity and natural gas consumption were the two largest energy sources in the Jackson built environment.

2020 Business-as-Usual Community-Wide Forecast

The City of Jackson community-wide residential and non-residential energy use were forecasted out to 2020 under a business-as-usual (BAU) scenario. Since the City's municipal electricity use is included with the community-wide energy usage, a separate forecast for municipal energy was not completed. The BAU forecast scenario was completed using the Statewide Energy Efficiency Collaborative (SEEC) ClearPath California toolkit. The BAU forecast estimates how energy use would change from 2005 to 2020 in the absence of any energy efficiency or renewable energy policies or programs. The two required inputs for a forecast: baseline energy consumption data and growth rates are presented in Appendix A and B respectively. The baseline data was pulled from the community-wide GHG emissions inventory. The growth rates were calculated using the City's UPlan growth projections of population and non-residential square footage.

The City's residential energy use was forecasted to increase 10% by 2020 using the projected change in population in Jackson. The annualized growth rates for population in Jackson were calculated based on the actual change in population from 2005 to 2013 and the projected growth in population for Jackson from the Amador County Transportation Commission's UPlan projections. (See Appendix B). The City's non-residential energy use was forecasted to stay flat by 2020 because there is no anticipated non-residential growth within the City limits. The annualized growth rates for non-residential square footage in Jackson were calculated based on the projected growth in non-residential square footage for Jackson from the Amador County Transportation Commission's UPlan projections, which projected no growth in the City limits. (See Appendix B).

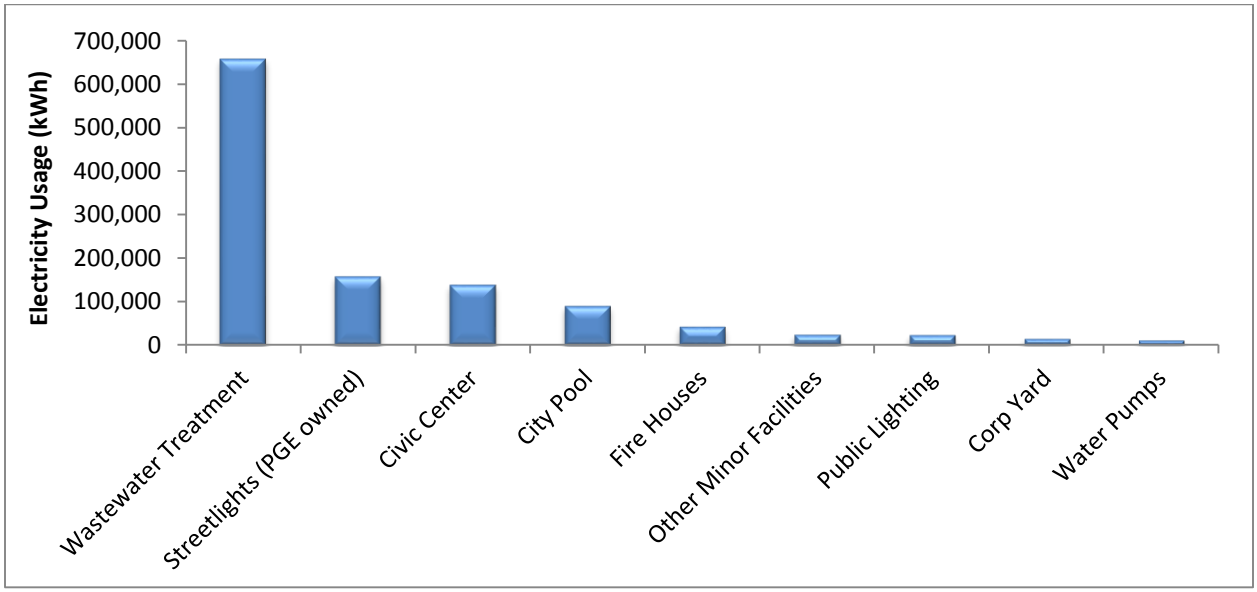
Baseline and BAU Forecast of Residential and Non-Residential Electricity and Natural Gas Use



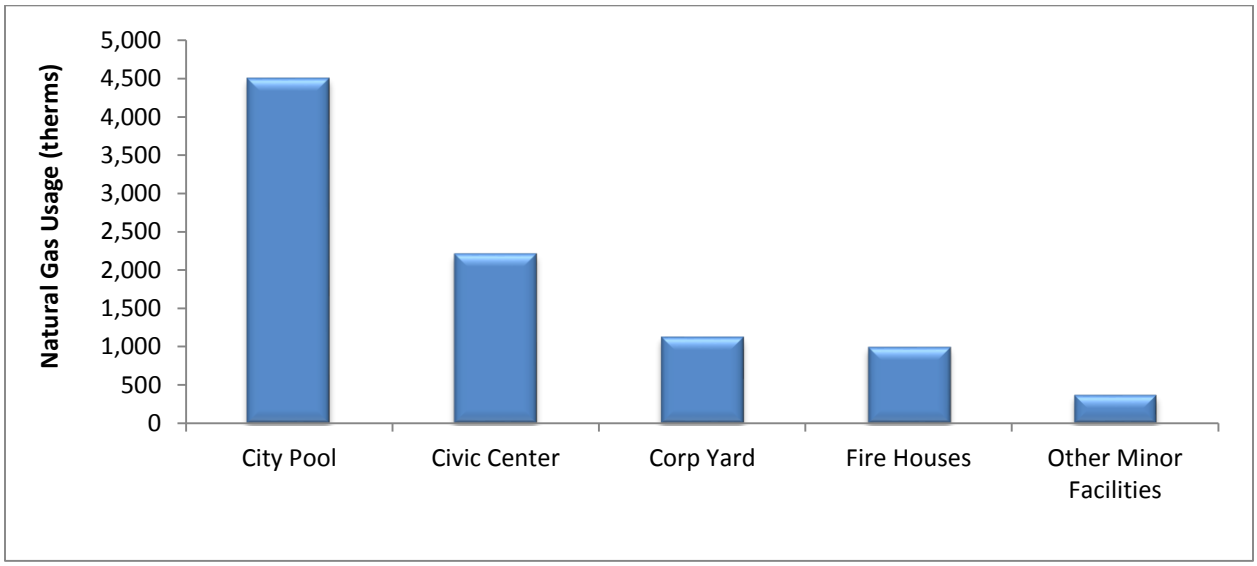
2005 Baseline Municipal Operations Inventory

The City of Jackson's municipal facilities use electricity and natural gas, with the wastewater treatment plant consuming the most energy. Significant electricity was also consumed for the civic center and the City pool. While the City's electricity consumption of about 1.1 million kWhs is around 2% of the community's total electricity consumption there are still significant opportunities for the City to reduce electricity usage and the associated costs. In 2005, the City spent $172,305 on electricity. Detailed electricity use is presented in Appendix A.

2005 Baseline Municipal Facilities Electricity Consumption (kWh)



2005 Baseline Municipal Facilities Natural Gas Consumption (therms)



CHAPTER 4: GOALS, STRATEGIES, AND ACTIONS

This chapter identifies goals, strategies and actions the City of Jackson can undertake to reduce municipal and community energy consumption, energy-related costs and energy-related GHG emissions in both the near and far term. The goals, strategies and actions pertain to the energy consumed by buildings and facilities in the residential, non-residential and municipal sectors. Other sectors, such as transportation and solid waste, are not included in this report but could be addressed in future studies.

The baseline and forecast data indicate that without a plan to reduce energy consumption, the community's energy use and associated costs will continue to increase over time. The community's residential electricity and natural gas use is forecasted to increase by 10% by 2020 and the community's non-residential electricity and natural gas use is forecasted to stay flat by 2020 because there is no anticipated non-residential growth within the City limits. The continued increase in non-renewable energy consumption also translates to more dollars spent on energy and additional air quality impacts within the region.

DEFINITION OF KEY TERMS

Key terms used in this report are defined below to assist in understanding the purpose of each and the interconnection between them. Definitions for some non-key terms are footnoted throughout the report at the bottom of the relevant page.

Goal

An expression of a desired outcome, 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.

For example: To 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.

For 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.

For example: Review existing lighting conditions and install new light fixtures where required.

Performance Indicator

A quantifiable measure that is used to gauge *performance* in meeting identified actions.

For example: Percentage of public space reviewed for safe lighting conditions.

Target

The numerical result that demonstrates achievement of a strategy.

For example: Fifty percent (50%) of public spaces reviewed by 2020.

BASIS FOR ENERGY GOALS AND STRATEGIES

To identify the most appropriate energy-efficiency strategies for the City, the following documents/resources were reviewed:

- 2005 Baseline Municipal Operations and Community-Wide GHG Inventories and forecast of future emissions (prepared by SBC in 2011 – 2014)
- 2012 Jackson General Plan and Housing Element
- 2014 Jackson Municipal Code
- Measures underway/in place in Jackson
- Measures in other similar jurisdictions
- Meetings/consultation with City staff
- Public input received from community members

There are a myriad of measures and practices to reduce energy consumption and emissions. Selection of those most appropriate for Jackson was based on the criteria below and in consultation with City staff:

- Potential of actions to reduce energy use
- Estimated cost to City to implement actions
- Estimated costs and savings for residents / business owners
- Availability of staff resources or other partner organizations to implement
- Availability of potential funding to assist with implementation
- Benefits to the community in addition to energy savings (e.g. cost savings, air-quality improvement)

ENERGY REDUCTION POTENTIAL

The energy reduction potential was calculated for applicable measures using data collected in the 2005 municipal and community-wide GHG inventories and the energy use forecasts combined with the estimated energy savings associated with completion of the applicable 2020 targets. The annual energy reduction potential was calculated using top-down methods to estimate energy savings achieved in 2020 by meeting the associated 2020 targets. Calculations are documented in Appendix C.

ENERGY COSTS AND SAVINGS

For the City, the economic implications of implementing the energy efficiency and reduction measures primarily involve costs associated with staff time and potential costs associated with retaining outside consultants to assist with program implementation. Using the City's 2013-14 budget, an estimate was made of low, medium and high cost ranges that could be incurred by the City to implement the action measures in the report. The potential costs savings realized from implementation of some of the measures were not factored into this range, given the uncertainty of program design details and how they would exactly be carried out. The purpose of the cost range is to provide a relative measurement for fiscal impact to the City that will assist in prioritizing the measures for implementation. For the City of Jackson, the following cost ranges are used in this report:

Cost to City (annual)	Low: 0-$4,000 Medium: $4,001 - $7,500 High: $7,501+

For residents and businesses, some reduction measures do not result in any notable private costs or savings. However, wherever possible, analysis and quantification was framed in terms of annual costs/savings (or average annual costs/savings). While there are funding sources and financing mechanisms available to offset private costs, calculations were based on a hypothetical average and did not include potential offsets. Almost all measures with private cost implications result in a return on investment in energy cost savings that will accrue over time, thus defraying some of the initial investment costs. The strategies were designed with a focus on actions with the highest return on investment.

Cost to Resident or Business (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater
Savings to Resident or Business (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater

ENERGY EFFICIENCY STRATEGIES POTENTIAL ENERGY SAVINGS

Potential annual energy savings in 2020 were calculated for each strategy and where applicable reported for residential and non-residential energy use. Combined the strategies in the EAP can potentially reduce energy use by 8,542,663 kWh and 56,157 therms.

Summary of Potential 2020 Annual Energy Savings

Strategy Area	Strategy Title			2020 Annual Energy Savings	
				Electricity (kWh / Year)	Natural Gas (therms / Year)
Existing Structures	1.1	Expand outreach and education to increase participation in voluntary home energy-efficiency programs.	Residential	865,187	25,044
	1.2	Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.	Non-Residential	1,871,611	19,958
New Construction	2.1	Improve compliance with Title24, Part 6 Green Building and Energy Efficiency Standards.	Residential	107,663	4,332
	2.2	Provide incentives for buildings to exceed the current Title24, Part 6 Energy Efficiency Standards.	Residential	24,320	1,494
Renewable Energy	3.1	Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.	Residential Non-Residential	4,322,868 1,037,646	
	3.3	Encourage new development projects to meet 70% of their energy needs from renewable resources.	Residential	56,748	3,486
Municipal Operations	4.1	Improve the energy efficiency of existing municipal structures.		62,465	1,843
	4.2	Evaluate the feasibility of improving energy efficiency of traffic signals and public lighting.	Street Lights	36,377	
	4.3	Evaluate the feasibility of improving energy efficiency of wastewater and potable water systems.	Potable Water Wastewater	2,239 131,682	
Water Conservation	5.1	Encourage residents and businesses to conserve water used indoors.		12,674	
	5.2	Encourage residents and businesses to conserve water used outdoors.		11,183	
Total Potential 2020 Annual Energy Savings				8,542,663	56,157

Energy Efficiency Goals, Strategies And Actions

The goals and strategies in this section are focused on improving the energy efficiency of existing and future buildings, reducing costs associated with energy consumption in municipal buildings and operations, and reducing the carbon intensity of the City's energy sources. The goals were designed with the California's preferred "loading order" in mind for meeting energy demand: first cost-effective energy efficiency, then cost-effective renewable energy, and finally conventional energy sources.

Summary of Goals and Strategies

Goal 1: Increase Energy Efficiency in Existing Structures

- **Strategy 1.1**: Expand outreach and education to increase participation in voluntary home energy-efficiency programs.
- **Strategy 1.2**: Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.
- **Strategy 1.3**: Identify and promote programs that help finance energy-efficiency and renewable-energy projects.

Goal 2: Increase The Energy Performance of New Construction

- **Strategy 2.1**: Improve compliance with Title 24 Green Building and Energy Efficiency Standards.
- **Strategy 2.2**: Provide incentives for buildings to exceed the current Title-24 Energy Efficiency Standards.
- **Strategy 2.3**: Reduce the heat island effect and related summer heat gain in residential and non-residential projects.

Goal 3: Increase Renewable Energy Use

- **Strategy 3.1**: Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.
- **Strategy 3.2**: Develop a comprehensive renewable energy program that provides outreach, financing, and technical assistance.
- **Strategy 3.3**: Encourage new development projects to meet 70% of their energy needs from renewable resources.

Goal 4: Increase Energy Efficiency in Municipal Structures and Operations

- **Strategy 4.1**: Improve the energy efficiency of existing municipal structures.
- **Strategy 4.2**: Evaluate the feasibility of improving the energy efficiency of public lighting.
- **Strategy 4.3**: Evaluate the feasibility of improving the energy efficiency of the potable water and wastewater infrastructure.

Goal 5: Increase Community Water Conservation and Efficiency to Reduce Associated Energy Use

- **Strategy 5.1**: Encourage residents and businesses to conserve water used indoors.
- **Strategy 5.2**: Encourage residents and businesses to conserve water used outdoors.

GOAL 1: INCREASE ENERGY EFFICIENCY IN EXISTING STRUCTURES

Approximately 52% of the housing stock in Jackson was built prior to the adoption of California's Title 24 energy standards in 1978 and the non-residential building stock is likely similarly dated. Improving the energy efficiency of existing buildings will save homeowners and businesses money by reducing their long-term energy costs. The City will leverage existing resources to expand education and outreach programs to promote energy efficiency in existing residential and non-residential structures.

Strategy 1.1: Expand outreach and education to increase participation in voluntary home energy-efficiency programs.

Residential energy-efficiency improvements have the potential to reduce energy bills and GHG emissions. The City will partner with PG&E, Amador County, the Energy Upgrade California alliance and other community organizations to leverage existing resources and expand public education and outreach campaigns that encourage residents to voluntarily make energy-efficiency improvements within their homes and to take advantage of the low-cost energy-efficiency financing programs described in Strategy 1.3 below. As part of the outreach program, the City will include on its website information on available energy-efficiency rebates and incentive programs. The website will also link to local case studies of homes that have implemented cost-effective, energy-efficiency improvements when available.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Partner with PG&E and Amador Tuolumne Community Action Agency to activate programs for income-eligible Jackson residents.	Short-Term (1-2 years)	Planning & Building Departments
2	Partner with PG&E, the Energy Upgrade California alliance and other community organizations to increase participation in energy efficiency rebates and incentive programs.	Short-Term (1-2 years)	Planning & Building Departments
3	Include on the City's website information on and links to residential energy-efficiency rebates, incentives, and case studies.	Short-Term (1-2 years)	Planning & Building Departments

	PERFORMANCE INDICATOR	TARGET
1	Percentage of households participating in energy-efficiency rebate programs.	20% participating by 2020
2	Percentage of households achieving an improvement in building energy efficiency.	20% achieving 30% savings in electricity use and 15% savings in natural gas use by 2020
3	Number of households achieving an improvement in building energy efficiency	417 Existing Households

Annual Energy Reduction Potential:

865,187 kWh
25,044 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High (depending on finance program)

Savings to Resident / Business Owner:

Low to High (depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

Strategy 1.2: Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.

Investments in building energy-efficiency retrofits can save considerable amounts of energy and reduce a business's operational costs. The greatest barriers to these improvements are lack of information about efficiency practices and scarcity of low-cost financing for the initial capital costs.

In partnership with PG&E, SBC and the Sierra Nevada Energy Watch program (SNEW), and local business organizations the City will provide outreach programs aimed at maximizing voluntary energy conservation within community businesses. These programs will target specific commercial sectors such as restaurants, supermarkets, retail, office, and manufacturing to provide useful energy and cost savings recommendations. The program will encourage businesses to conduct benchmarking[10], energy audits and implement energy-efficiency projects. The City will include on its website information on energy-reduction programs specifically for commercial and industrial businesses. Case studies of businesses that implemented cost-effective, energy-efficiency improvements can be showcased on the website, focusing on those in Jackson when possible.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Partner with PG&E and SBC to expand the SNEW program in Jackson.	Short Term (1-2 years)	Planning & Building Departments City Manager's Office
2	Provide links on the City's website to tools that demonstrate the financial benefits of efficiency upgrades to local businesses.	Short-Term (1-2 years)	Planning & Building Departments City Manager's Office
3	Include on the City's website information on and links to non-residential energy-efficiency rebates, incentives, and case studies.	Short-Term (1-2 years)	Planning & Building Departments
	PERFORMANCE INDICATOR	**TARGET**	
1	Number of businesses served by SNEW with energy-efficiency improvements.	60 served by 2020	
2	Percentage of businesses participating in energy-efficiency rebate programs.	20% participating by 2020	
3	Percentage of businesses achieving an improvement in building energy efficiency.	20% achieving 30% savings in electricity use and 15% savings in natural gas use by 2020	

[10] Energy benchmarking compares a building's energy performance against that of similar buildings.

Annual Energy Reduction Potential:

1,871,611 kWh
19,958 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High (depending on finance program)

Savings to Resident / Business Owner:

Low to High (depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

Strategy 1.3: Identify and promote programs that help finance energy efficiency and renewable energy projects.

The up-front costs of energy efficiency improvements can be a considerable barrier for many homeowners and businesses. However there are numerous options to address this challenge, including PG&E's on-bill financing program, low interest loans, energy-efficient mortgages, and Property Assessed Clean Energy (PACE) programs.

One example, on-bill financing, works in conjunction with PG&E'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. For further information refer to this report's implementation section and appendices.

Another example, Property Assessed Clean Energy (PACE) programs are an innovative financing tool that allows residential and non-residential property owners to receive financing for energy-efficiency, clean-energy and water-efficiency projects, which they repay through a voluntary special assessment on their property tax bill. There are several organizations in California that provide cities and counties in California with access to PACE financing programs at no-cost to the local governments.

The City will partner with PG&E, community organizations and local banks to identify and promote existing and potential financing programs. The City will include links to financing programs on its website.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Partner with PG&E, community organizations and local banks to implement PACE financing and promote existing financing programs.	Short Term (1-2 years)	City Manager's Office
2	Include on the City's website descriptions of and links to existing financing programs for energy efficiency upgrades.	Short Term (1-2 years)	Planning & Building Departments City Manager's Office
	PERFORMANCE INDICATOR	**TARGET**	
1	N/A	N/A	

Annual Energy Reduction Potential:

Supports Strategy 1.1 and 1.2

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

Low to High (depending on finance program)

Savings to Resident / Business Owner:

Low to High (depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, Local Banks and City Funds

GOAL 2: INCREASE THE ENERGY PERFORMANCE OF NEW CONSTRUCTION

New buildings offer a significant opportunity to achieve high levels of energy efficiency through advanced materials and design. The City will work with developers and contractors to improve compliance with existing energy and green building standards and promote measures to exceed the energy standards. The City will also review the potential for incentives for buildings that exceed the Title 24 Energy Efficiency Standards.

Strategy 2.1: Improve compliance with Title 24 Green Building and Energy Efficiency Standards.

The 2013 revisions to the Title 24 Green Building (Part 11) and Energy Efficiency Standards (Part 6) help make new construction significantly more energy efficient. The Energy Standards are expected to be 25% more efficient than previous standards for residential construction and 30% more efficient for non-residential construction according to the California Energy Commission.[11] The California Green Building Standards include mandatory as well as voluntary green building measures that also have energy saving benefits. Assisting developers and contractors in understanding the standards will help them achieve higher efficiencies on their projects. The energy reduction potential is based on full compliance with the standards.

The City will provide opportunities for building officials and planning department staff to attend Title 24 energy and green building trainings as well as promote trainings and educational materials to contractors and developers. EnergyCodeACE and PG&E offer free Title 24 Part 6 tools, trainings and resources to assist the building industry, related stakeholders and the public to comply with the 2013 Building Energy Efficiency Standards.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Provide opportunities for City building officials and planning department staff to attend Title 24 trainings.	Short Term (1-2 years)	Building & Planning Department
2	Include links to Title 24 energy and green building trainings and educational resources on the City's website.	Short Term (1-2 years)	Building & Planning Departments
	PERFORMANCE INDICATOR	**TARGET**	
1	Percentage of City staff that attended Title 24 energy and green building trainings.	100% of Building & Planning staff by 2020	
2	Percentage of New Construction complying with Title 24.	100% of New Construction by 2020	

Annual Energy Reduction Potential:

107,663 kWh
4,332 therms

Cost to City:

Low

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

High

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

[11] http://www.energy.ca.gov/releases/2012_releases/2012-0531_energy_commission_approves_approves_more_efficient_buildings_nr.html

Strategy 2.2: Provide incentives for buildings to exceed the current Title 24 Energy Efficiency Standards.

Providing incentives for energy-efficient buildings, such as expedited permit processing, encourages developers to explore incorporating energy-efficient building features into their projects, which can save the property owner money over the life of the building. Reduced permitting times 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.

The City will determine the feasibility of providing incentives or awards for buildings that exceed the current Title 24 Energy Efficiency Standards. The City will provide information to contractors and developers on available incentives and education resources related to energy efficiency and green building. The City's website will include information on available incentives and educational resources.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Determine the feasibility of providing incentives or awards for new buildings that exceed Title 24 energy standards.	Short Term (1-2 years)	Planning & Building Departments
2	If feasible, establish expedited permit processing for projects that exceed Title 24 energy standards by 30%.	Short Term (1-2 years)	Planning & Building Departments
3	Explore incentives that encourage applicants to exceed Title 24 energy standards. Research what other jurisdictions have implemented.	Short Term (1-2 years)	Planning & Building Departments
	PERFORMANCE INDICATOR	**TARGET**	
1	Percentage of new residential housing units exceeding Title 24 energy standards.	15% of buildings exceeding energy standards by 30% by 2020	
2	Percentage of new non-residential buildings exceeding Title 24 energy standards.	15% of buildings exceeding energy standards by 15% by 2020	

Annual Energy Reduction Potential:

24,320 kWh
1,494 therms

Cost to City:

Low

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

High

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

Strategy 2.3: Reduce the heat island effect[12] and related summer heat gain in residential and non-residential projects.

Trees, shade structures, cool (high albedo / solar reflectance) paving and roofing materials reduce the amount of solar energy absorbed and therefore temperature of rooftops and parking lots. By increasing the use of shading and cool paving and roofing materials it is possible to reduce heat gain in residential buildings and commercial centers. This decrease in ambient air temperatures and reduced heat gain in warm summer months can reduce the amount of energy required for air conditioning.

Requirements could include a) tree standards for existing streets and parking lots; b) heat gain mitigation requirements for new parking lots (through the use of shade structures, trees or cool pavement, etc.); c) cool roofing requirements for new construction. Shade structures can also accommodate solar panels thus serving a dual purpose.

The City will update the existing landscaping ordinance, design guidelines and municipal codes to reduce cooling loads through the use of shade trees, shade structures, cool pavement and cool roofs in new construction projects.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Update landscaping ordinance to include parking lot heat-gain mitigation design guidelines.	Near Term (3-5 years)	Planning & Building Departments
2	Require new development projects with parking lots to mitigate heat gain through the use of shade trees, shade structures with or without solar arrays, or cool pavement.	Near Term (3-5 years)	Planning & Building Departments
3	Update landscaping ordinance to require street trees in residential projects to maximize energy benefits and include guidance on tree types, planting, and maintenance.	Near Term (3-5 years)	Planning & Public Works Departments
4	Promote the installation of solar shade structures by requiring new development projects with more than 80 spaces to obtain and submit a quote for solar shade structures with permit application.	Near Term (3-5 years)	Planning & Building Departments
	PERFORMANCE INDICATOR	TARGET	
	N/A	N/A	

Annual Energy Reduction Potential:

Supports Strategies 2.1 and 2.2

Cost to City:

Medium to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

Medium

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations and City Funds

[12] Increase in ambient air temperature due to excess heat created by non-permeable surfaces (such as roofs and pavement) being exposed to high temperatures during hot sunny days.

GOAL 3: INCREASE RENEWABLE ENERGY USE

Building rooftops and parking lots provide excellent opportunities for solar energy generation. In particular, non-residential and municipal facilities tend to have large, flat roofs that are well suited for solar equipment. The City will evaluate the local solar market potential and develop a comprehensive solar program that encourages the development of renewable energy. Local renewable-energy projects benefit the City's economy by creating jobs and reducing energy costs.

Strategy 3.1: Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.

To facilitate installation of renewable energy systems, the City will evaluate the solar potential within Jackson. The City will also formulate and evaluate strategies needed to expand solar development. The City will review the existing permitting process and identify the current barriers to solar development. A streamlined permitting process using existing best practices will be developed to further promote and expedite the installation of solar systems.

The American Solar Transformation Initiative (ASTI) provides no-cost planning assistance to local governments in California to develop a Solar Roadmap for their communities. The program provides participating local governments with an assessment of local solar market potential, estimated economic and environmental impacts, assessment of current solar processes and customized solar roadmaps to accelerate solar installations.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Evaluate the residential, non-residential and municipal solar potential in the community.	Short Term (1-2 years)	Planning Department
2	Review existing permitting process and identify barriers to solar development.	Short Term (1-2 years)	Planning and Building Departments
3	Develop streamlined permitting process for solar developments.	Short Term (1-2 years)	Planning and Building Departments

	PERFORMANCE INDICATOR	TARGET
1	kWs of solar installed on residential structures.	2,520 kWs by 2020
2	Number of homes installing solar systems	417 Households by 2020
3	kWs of solar installed on non-residential structures.	605 kWs by 2020
4	Number of non-residential structures installing solar systems	20 Non-Residential Structures by 2020

Annual Energy Reduction Potential:

5,360,514 kWh

Cost to City:

Low to High

Cost to Resident / Business Owner:

None to High (depending on finance program)

Savings to Resident / Business Owner:

None to High (depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

American Solar Transformation Initiative and City Funds

Strategy 3.2: Develop a comprehensive renewable energy program that provides outreach, financing, and technical assistance.

Outreach efforts will aim to maximize community participation in renewable energy generation and emphasize energy cost savings. The program will make available information on how home and business owners can incorporate solar hot water heaters and solar photovoltaic systems into their living and working environments. Solar water heating is a proven technology that has a short payback period, providing owners with cost savings and two to three year paybacks, when solely owner-financed.

The City will maintain a page of their website dedicated to renewable energy programs with tools available for making informed decisions on renewable energy, financing options and the permitting process. The American Solar Transformation Initiative provides participating local governments with a jurisdiction-specific public landing page for community education, including tools to evaluate the costs of solar projects and to request and compare quotes from local and regional solar vendors. The City will work with PG&E, community organizations and local banks to expand and promote available financing programs.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Partner with PG&E and community organizations to provide educational materials and tools to help owners make informed decisions about the costs and benefits of renewable energy projects.	Short Term (1-2 years)	Planning & Building Departments
2	Update the City's website with links and tools to evaluate renewable energy systems and how to request quotes from local and regional solar vendors.	Short Term (1-2 years)	Planning & Building Departments
3	Partner with PG&E, community organizations and local banks to expand and promote available financing options.	Short Term (1-2 years)	Planning & Building Departments
	PERFORMANCE INDICATOR	TARGET	
	N/A	N/A	

Annual Energy Reduction Potential:

Supports Strategy 3.1

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

American Solar Transformation Initiative and City Funds

Strategy 3.3: Encourage new development projects to meet 70% of their energy needs from renewable resources.

Solar water heating (SWH) and photovoltaic solar systems (PV) are two proven technologies that can be used to replace traditional energy use in the built environment. Commercial-scale SWH systems are designed to provide large quantities of hot water using solar energy. A typical SWH system includes roof or wall-mounted solar collectors that work with a pump, heat exchanger, and storage tanks. SWH systems can dramatically reduce the amount of natural gas or electricity used for heating water, lowering the fossil-fuel energy use associated with water heating.

Solar PV systems have reduced in cost significantly over the last decade and will often have payback periods of 8 to 15 years. Additionally, there are new financing mechanisms; such as power purchase agreements, solar leases and Property Assessed Clean Energy financing, 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 with a tax credit for 30% of qualified expenditures. There are incentives for non-residential buildings as well. The incentives are currently set to expire on December 31st 2016.

Providing recognition or awards for projects that will meet 70% of its energy needs from renewable sources will further incentivize this program.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Determine the feasibility of providing incentives or awards for new buildings that meet 70% of energy needs from renewable sources.	Short Term (1-2 years)	Planning & Building Departments
2	Provide information to contractors and developers on the current incentives for renewable energy developments during plan review.	Short Term (1-2 years)	Planning & Building Departments
	PERFORMANCE INDICATOR	**TARGET**	
1	Percentage of new residential construction that meets 70% of energy needs with renewable energy.	15% of residential new construction by 2020	
2	Percentage of new non-residential construction that meets 70% of energy needs with renewable energy.	15% of non-residential new construction by 2020	

Annual Energy Reduction Potential:

56,748 kWh
3,486 therms

Cost to City:

Low to Medium

Cost to Resident / Business Owner:

None to High (depending on finance program)

Savings to Resident / Business Owner:

None to High (depending on finance program)

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, American Solar Transformation Initiative and City Funds

GOAL 4: INCREASE ENERGY EFFICIENCY IN MUNICIPAL STRUCTURES AND OPERATIONS

Measures undertaken by the City to improve energy efficiency not only reduce energy costs but also set an example for the local community and surrounding areas[13]. The 2005 municipal operations inventory indicated that the City consumed 1,163,811 kWh of electricity in municipal buildings, water and wastewater facilities, and public lighting. The two largest consumers were the wastewater treatment facility (57%) and buildings/facilities (27%). Additionally, the City's buildings/facilities consumed 9,217 therms of Natural Gas. Improving the efficiency of the Wastewater Treatment Plant as well as Installing Energy-Star rated equipment, lighting controls and programmable thermostats can reduce this energy use. Energy use can also be tracked by benchmarking municipal buildings with EPA's Portfolio Manager.

Strategy 4.1: Improve energy efficiency of existing municipal structures.

The City will establish a purchasing policy that requires new electrical equipment to be Energy Star rated (or similar energy usage rating). The City will benchmark municipal facilities using the free EPA Energy Star Portfolio Manager software to track energy use and determine the efficiency of existing facilities. The facilities with the greatest energy use or highest energy intensity will be targeted for energy audits and retro-commissioning[14] to optimize energy use and identify energy-efficiency opportunities.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Establish a purchasing requirement that all new electrical equipment be Energy Star rated when available.	Short Term (1-2 years)	City Manager's Office
2	Benchmark municipal facilities using the EPA Energy Star Portfolio Manager.	Short Term (1-2 years)	City Manager's Office
3	Conduct energy audit and retro-commissioning of municipal facilities.	Near Term (3-5 years)	City Manager's Office

	PERFORMANCE INDICATOR	TARGET
1	Purchasing policy in place.	2015
2	Benchmark municipal facilities.	2015
3	Audit and retro-commission municipal facilities.	2017
4	Percentage of existing buildings energy use reduced.	20% of energy use reduced by 2020

Annual Energy Reduction Potential:

62,465 kWh
1,843 therms

Cost to City:

Low to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, Energy Service Companies and City Funds

[13] In 2003 the City replaced the HVAC units with high-efficiency HVAC units. In 2008/2009 all ballasts and tubes were replaced in all City facilities and incandescent bulbs were swapped out with LED bulbs at the City's Civic Center.

[14] Retro-commissioning is a systematic process to improve an existing building's energy performance and occupants comfort through a whole-building systems approach

Strategy 4.2: Evaluate the feasibility of improving energy efficiency of public lighting.

In 2005, the City used 181,883 kWh for public lighting spending $48,301. In 2010, the City received an Energy Efficiency Block Grant award to replace high-pressure sodium streetlights with LEDs. The City will determine the feasibility and evaluate the cost-effectiveness of converting the remaining street lights and other public lighting to higher efficiency LED lighting.

PG&E offers rebates for the replacement of streetlights with LEDs and full turnkey LED replacement services to local governments.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Evaluate cost-effectiveness of upgrading the remaining street lights to energy efficient LEDS. Identify phasing and funding sources to offset costs.	Near Term (3-5 years)	Public Works Department City Manager's Office
	PERFORMANCE INDICATOR	**TARGET**	
1	Street light upgrade.	100% upgrade by 2020	
2	Percentage of public lighting energy use reduced.	20% of energy use reduced by 2020	

Annual Energy Reduction Potential:

36,377 kWh

Cost to City:

Low to High

Cost to Resident / Business Owner:

None

Savings to Resident / Business Owner:

None

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, PG&E and City Funds

Strategy 4.3: Evaluate the feasibility of improving the energy efficiency of the potable water and wastewater infrastructure.

In 2005, the City used 658,409 kWh of electricity for wastewater treatment spending about $78,990. Additionally, the City used 11,194 kWh of electricity for potable water treatment and delivery spending about $1,950 The City will require energy efficiency analysis in all potable water and wastewater planning documents and facility upgrades by including energy efficiency provisions in RFPs the City releases for work.

The City will also benchmark the potable water and wastewater facilities using the free EPA Energy Star Portfolio Manager software and Energy Use Assessment Tool to track energy use, conduct utility bill analysis and identify efficiency opportunities. The City will evaluate the feasibility of conducting audits of the potable water and wastewater system to identify energy efficiency improvements to pumps and treatment plants. Additionally, the City will implement a leak detection program to improve efficiency of the distribution and collection systems.

PG&E offers technical assistance incentives and rebates for the installation of energy efficient equipment to local governments.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Require energy efficiency analysis in all potable water and wastewater planning documents and facility upgrades.	Short Term (1-2 years)	Public Works Department City Manager's Office
2	Benchmark potable water and wastewater treatment facilities using EPA's Portfolio Manager and Energy Use Assessment Tool.	Short Term (1-2 years)	Public Works Department City Manager's Office
3	Evaluate the feasibility of conducting energy audits of the potable water and wastewater system and implementing a leak detection program.	Near Term (3-5 years)	Public Works Department

	PERFORMANCE INDICATOR	TARGET
1	Energy Efficiency RFP Policy Complete	2016
2	Potable water and wastewater facilities benchmarked	2016
3	Percent of potable water and wastewater facilities energy use reduced	20% reduction in energy use by 2020

Annual Energy Reduction Potential:

133,921 kWh

Cost to City:

Low to High

Cost to Resident / Building Owner:

None

Savings to Resident / Building Owner:

Low

Community Co-Benefits:

Reduced Energy Costs
Improved Air Quality

Potential Funding Sources:

Partnerships with Organizations, PG&E and City Funds

GOAL 5: INCREASE COMMUNITY WATER CONSERVATION AND EFFICIENCY TO REDUCE ASSOCIATED ENERGY USE

The state of California's official goal is to reduce per capita water use by 20% by 2020. In a typical California home the major indoor water users are toilets (33%), showers (22%), faucets (18%), washing machines (14%), and leaks (12%). Dishwashers rank last – 1%.[15] Given that indoor water is delivered to a few, readily identifiable appliances, it is easy to target those with the greatest water conservation potential. Since it requires significant energy to source, treat and deliver water to community members, water conservation measures have the effect of reducing the amount of energy that the City needs to provide water.

Strategy 5.1: Encourage residents and businesses to conserve water used indoors.

The measures below focus on those most readily implementable in light of existing rebate/retrofit programs. Based on the 2013 study referenced in the footnote below, use of more water efficient toilets, showers, faucets, washing machines and leak detection could reduce water usage by 15 gallons per capita per day (GPCD), a 25% reduction from typical daily residential water usage of 62 GPCD.

The City will continue to encourage Jackson residents and businesses to voluntarily reduce their water usage. The City will work with PG&E and Amador Water Agency (AWA) to explore the feasibility of implementing new water efficiency programs. Programs could include a toilet swap event, or free low-flow showerhead giveaways.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Work with AWA to expand existing water efficiency programs in Jackson.	Short Term (1-2 years)	City Manager's Office
2	Explore with AWA and PG&E the feasibility of implementing new programs.	Near Term (3-5 years)	City Manager's Office
3	Redesign the water bill format to encourage water conservation in residential and commercial uses.	Near Term (3-5 years)	City Manager's Office
	PERFORMANCE INDICATOR	**TARGET**	
1	Percentage of households and businesses that voluntarily reduce indoor water use by 20% or more.	100% of households by 2020[16]	

Annual Energy Reduction Potential:

12,674 kWh

Cost to City:

Low

Cost to Resident / Business Owner:

Low

Savings to Resident / Business Owner:

Low

Community Co-Benefits:

Reduced Water Use, Reduced Wastewater Costs, Reduced Energy Costs

Potential Funding Sources:

Partnerships with AWA, other Organizations and City Funds

[15] California Water Plan Update, Chapter 3. Urban Water Use Efficiency. 2013. http://www.water.ca.gov/calendar/materials/vol3_urbanwue_apr_release_16033.pdf

[16] Urban and agricultural water suppliers who do not meet the 20% reduction required by SB X7-7 (enacted in 2009) will not be eligible for state water grants or loans.

Strategy 5.2: Encourage residents and businesses to conserve water used outdoors.

Significant water savings can be achieved in the outdoor environment through a few readily implementable programs. The City will work with Amador Water Agency (AWA) to evaluate the feasibility of providing Water Wise House calls where a trained water efficiency specialist will on request visit homes, review indoor and outdoor water needs, make water efficiency recommendations and provide water saving devices or if desired, will install certain water saving devices. Additionally, the City will evaluate the feasibility of offering Water-Wise business calls where trained technicians will come to a commercial site, check for leaks, conduct outdoor irrigation check-ups and provide watering schedules.

The City will encourage or require new construction to include California Green Building Code's (CALGreen) voluntary water-efficiency measures. Expedited permit review for projects meeting the voluntary CALGreen water-efficiency measures will be examined for feasibility. Additionally, the City will install water-efficient landscaping in areas managed by the City to serve as public demonstration areas.

	IMPLEMENTATION ACTION	TIME TABLE	RESPONSIBILITY
1	Work with AWA to evaluate the feasibility of offering Water Wise programs and additional water efficiency rebates.	Short Term (1-2 years)	Planning Department City Manager's Office
2	Encourage voluntary compliance with CALGreen water efficiency measures by distributing information detailing the measures to builders, contractors and realtors.	Short Term (1-2 years)	Planning and Building Departments
3	Evaluate the feasibility of offering incentives for or requiring the voluntary water efficiency measures in CALGreen.	Near Term (3-5 years)	Planning & Building Departments
4	Design a demonstration zero-water landscape as a teaching tool for reducing outdoor water use.	Near Term (3-5 years)	Planning & Public Works Departments
	PERFORMANCE INDICATOR	**TARGET**	
1	Percentage of households and businesses that voluntarily reduce indoor water use by 20% or more.	100% of households by 2020	

Annual Energy Reduction Potential:

11,183 kWh

Cost to City:

Low to High

Cost to Resident / Business Owner:

Low

Savings to Resident / Business Owner:

Low

Community Co-Benefits:

Reduced Water Use, Reduced Energy Costs

Potential Funding Sources:

Partnerships with AWA, other Organizations and City Funds

CHAPTER 5: IMPLEMENTATION

This chapter provides a roadmap for implementing the EAP. The City of Jackson recognizes that a clear and straight-forward implementation program is essential to achieve the goals of the EAP. To successfully implement the EAP, the City, regional organizations and community members will need to work together and leverage existing and new national and state programs.

Ensuring the strategies translate from policy language into on-the-ground results is critical to the success of the EAP. To facilitate this, each strategy described in Chapter 4 contains a table that identifies the specific actions the City plans to carry out in order to achieve the identified goals. The second section of each table provides performance indicators and targets that enable staff, Council members and the public to track strategy implementation and evaluate the effectiveness of the EAP.

Evaluating the effectiveness of the EAP requires two key tasks: evaluation of the EAP as a whole and evaluation of the individual strategies. Community-wide emissions inventories provide the best indication of the overall EAP effectiveness, 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 2005 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.

While community-wide inventories will provide information about the EAP's overall effectiveness, 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 of PG&E, the City will 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 must be prepared to evaluate and revise the strategies and actions over time. It is likely new information, technology and programs will emerge; therefore, the City must be ready to take advantage of these opportunities. Additionally, the City will prepare interim progress reports, using a template provided by SBC, on an annual basis to track performance.

IMPLEMENTATION PROGRAM

The Implementation Program identifies specific actions and steps the City can take to achieve the specified 2020 targets. The following matrix prioritizes the actions by year based on staff resources, potential funding availability and partner organization's capacity. The matrix serves as a guidepost for Staff to initiate actions in order to implement the EAP and track progress.

EAP Implementation Matrix*

TIME TABLE	IMPLEMENTATION ACTION	SUPPORTS	RESPONSIBILITY	INFORMATION SOURCES
2015	Partner with PG&E and regional organizations to activate existing energy efficiency and water efficiency programs	1.1.1 1.1.2 1.2.1 1.3.1 3.2.1 5.1.1	Planning & Building Departments City Manager's Office	Pacific Gas and Electric Company
	Provide information on and opportunities for staff, contractors and developers to attend training on Title 24	2.1.1 2.1.2	Planning & Building Departments	Pacific Gas and Electric Company
	Develop solar roadmap to analyze solar potential, review barriers to solar and streamline permitting	3.1.1 3.1.2 3.1.3	Planning & Building Departments	American Solar Transformation Initiative
	Adopt purchasing guidelines, benchmark municipal facilities and require energy efficiency analysis in all potable water and wastewater projects	4.1.1 4.1.2 4.3.1 4.3.2	City Manager's Office	Pacific Gas and Electric Company
2016	Update the City's website with information and links to energy efficiency programs, case studies, financing programs.	1.1.3 1.2.2 1.2.3 1.3.2	Planning & Building Departments City Manager's Office	Pacific Gas and Electric Company
	Determine the feasibility of offering incentives for new construction that completes a green building checklist including: exceed Title 24 energy requirements, meet 70% of energy needs with on-site renewable energy and exceed water efficiency requirements.	2.2.1 2.2.2 2.2.3 3.3.1 5.2.2 5.2.3	Planning & Building Departments	Pacific Gas and Electric Company
	Partner with PG&E, community organizations and local banks to promote and expand financing options for energy-efficiency, renewable-energy and water-efficiency projects	3.2.2 3.2.3 3.3.2 5.2.1	Planning & Building Departments	Pacific Gas and Electric Company American Solar Transformation Initiative
2017	Develop heat gain mitigation guidelines and ordinances for streets and parking lots.	2.3.1 2.3.2 2.3.3 2.3.4	Planning, Building & Public Works Departments	Pacific Gas and Electric Company
	Conduct energy audits, retro-commissioning on municipal facilities. Implement cost-effective energy efficiency and leak detection projects	4.1.3 4.3.3	City Manager's Office	Pacific Gas and Electric Company
	Evaluate the cost-effectiveness of upgrading remaining street lights to LED.	4.2.1	Public Works Department City Manager's Office	Pacific Gas and Electric Company
	Work with AWA to redesign water bills to promote conservation, develop/market new water-efficiency programs including design of a zero-water demonstration garden.	5.1.2 5.1.3 5.2.4	Planning, Building & Public Works Departments	Amador County Water Agency

* Numbering system (1.1.1) refers to Goal 1, Strategy, Action 1

FUNDING SOURCES AND FINANCING MECHANISMS

This section describes potential funding sources and financing mechanisms that the City can pursue to offset the financial burden of implementing the EAP. Each EAP strategy is accompanied with a simplified analysis of costs and savings, potential funding sources, and partnership opportunities. The spectrum of potential public and private funding sources is ever evolving and will need to be continually evaluated. This section outlines funding options that are currently available (as of December 2014). For additional information on energy efficiency programs and financing programs refer to Appendix D and F respectively.

- U.S. Department of Energy (DOE)
- California Energy Commission (CEC)
- California Infrastructure and Economic Development Bank (IBANK)
- California Statewide Communities Development Authority (CSCDA)
- Pacific Gas and Electric Company (PG&E)

U.S. Department of Energy

The U.S. DOE provides formula grant funding and technical assistance for state and local governments to manage weatherization and clean energy programs including the Weatherization Assistance Program, State Energy Program, Energy Efficiency and Conservation Block Grant Program and American Solar Transformation Initiative.

California Energy Commission

The CEC offers low-interest loans to public institutions to finance energy-efficiency and energy generation projects on a first-come, first-serve basis. Interest rates are currently between zero and one percent. The CEC also manages the Energy Partnership Program, which provides no-cost (up to $20,000) technical assistance to public agencies. Technical assistance includes conducting energy audits, preparing feasibility studies, contractor assistance and design review consultation among other services. The CEC also funds Energy Upgrade California, which was designed to be Californian's one-stop-shop for home and business improvement projects that lower energy use, conserve water and natural resources. Californians can use the site to plan upgrade projects, locate participating contractors, and find rebates and incentives including up to $6,500 towards whole house energy upgrades.

California Infrastructure and Economic Development Bank

The IBANK finances public infrastructure and private development that promotes opportunities for local jobs, contributes to a strong economy and improves the quality of life in California communities. In September 2014, California IBANK launched the Clean Energy Finance Center and the Statewide Energy Efficiency Program to provide low-cost financing to State and local governments for approved energy efficiency projects. The targets will be clean energy projects such as generation, distribution, transmission and storage; energy conservation measures; environmental mitigation measures; and water treatment and distribution.

California Statewide Communities Development Authority

The CSCDA is a joint powers authority with more than 500 cities, counties and special districts as Program Participants. CSCDA provides California's local governments with an effective tool for the timely financing of community-based public benefit projects. CSCDA provides program participants with two energy financing programs. The Sustainable Energy Bond Program, which provides access to tax-exempt financing for energy efficiency projects through contracts with Energy Service Companies that contain guaranteed energy savings to cover the full cost of all retrofit work. The CaliforniaFIRST program provides local governments access to a multi-jurisdictional Property Accessed Clean Energy Program that allows property owners to secure upfront financing for energy and water-saving improvements, which they repay through a voluntary special assessment on their property tax bill. CSCDA is also in the process of developing OPEN PACE, a full turnkey resource for local governments where qualified program administrators will develop managed contractor networks within the community, provide 100% financing and file repayment obligations through the property tax bills.

Pacific Gas and Electric Company

PG&E provides technical assistance, rebates and incentives, and financing options to promote energy efficiency and renewable energy projects. For Residential customers, PG&E offers income-eligible customers monthly discounts and free energy saving improvements. PG&E also offers appliance rebates and whole-home upgrade incentives. For Non-Residential customers, PG&E offers the Energy Efficiency Financing program, which provides businesses and government agencies access to 0% loans up to $100,000 for businesses and $250,000 for government agencies. PG&E also offers incentives and technical assistance to improve the operational performance of facilities' equipment, lighting and control systems through a retro-commissioning program. Additionally, PG&E offers design assistance, incentives and educational resources for new construction that exceeds Title 24 energy efficiency standard through the Savings By Design program.

APPENDIX A: JACKSON BASELINE ENERGY USE

The majority of electricity in Jackson is provided by utilities though independent energy service providers also provide a small percentage as direct access electricity.[1] Utility electricity and natural gas consumption data was collected from Pacific Gas and Electric Company (PG&E) for all accounts within the Jackson city limits. Due to confidentiality laws, PG&E was unable to release direct-access electricity consumption within the Jackson city limits. The direct-access electricity consumption within Jackson was estimated from county-level, direct-access electricity data provided by the California Energy Commission (CEC). The total direct-access electricity consumption for Amador County was used to determine the ratio of direct-access electricity use to utility-provided electricity use for residential and non-residential energy use. This ratio was applied to the utility-provided electricity use within Jackson to determine an estimate of the direct-access electricity consumed within Jackson. Non-utility propane, fuel oil and wood consumption used for space and water heating was estimated using National Oceanic and Atmospheric Administration reported heating degree days for San Joaquin Drainage in 2005, the number of homes using non-utility fuels for home heating reported by the U.S. Census Bureau 2005-2009 American Community Survey, and U.S. Environmental Protection Agency reported space and water heating factors. For detailed references refer to the City of Jackson 2005 Community-Wide Greenhouse Gas Emissions Inventory.

Table A-1: Jackson 2005 Baseline Residential Energy Use by Energy Source

Energy Source	Value	Units	Data Source
Electricity Consumption - PG&E	14,392,546	kWh	Pacific Gas and Electric Company
Electricity Consumption - Direct Access	27,236	kWh	California Energy Commission
Total Electricity Consumption	14,419,782	kWh	
Natural Gas Consumption	834,814	Therms	Pacific Gas and Electric Company
Propane (LPG) Consumption	49,490	Gallons	NOAA, U.S. EPA and U.S. Census Bureau
Fuel Oil / Kerosene Consumption	5,676	Gallons	NOAA, U.S. EPA and U.S. Census Bureau
Wood for Home Heating Consumption	213	Cords	NOAA, U.S. EPA and U.S. Census Bureau

Table A-2: Jackson 2005 Baseline Non-Residential Energy Use by Energy Source

Energy Source	Value	Units	Data Source
Electricity Consumption - PG&E	25,755,569	kWh	Pacific Gas and Electric Company
Electricity Consumption - Direct Access	5,437,947	kWh	California Energy Commission
Total Electricity Consumption	31,193,516	kWh	
Natural Gas - PG&E	665,276	Therms	Pacific Gas and Electric Company

[1] Direct-access electricity is energy supplied by a competitive energy service provider other than a utility, but uses a utility's transmission lines to distribute the energy

Utility electricity consumption data was collected from PG&E for all accounts paid for by the City of Jackson. In 2005, the city also used natural gas in municipal facilities.

Table A-3: Jackson 2005 Baseline Municipal Buildings Energy Use by Energy Source

Energy Source	Value and Units		Data Source
	kWh	Therms	
Civic Center Energy Consumption	139,200	2,217	Pacific Gas and Electric Company
City Pool Energy Consumption	90,472	4,500	Pacific Gas and Electric Company
Fire Houses Energy Consumption	42,885	997	Pacific Gas and Electric Company
Corporation Yard Energy Consumption	15,066	1,131	Pacific Gas and Electric Company
Other Minor Facilities Energy Consumption	24,702	372	Pacific Gas and Electric Company
Total Municipal Buildings Energy Consumption	**312,325**	**9,217**	

Table A-4: Jackson 2005 Baseline Public Lighting Energy Use by Energy Source

Energy Source	Value	Units	Data Source
PG&E Owned Street Lights Electricity Consumption	158,288	kWh	Pacific Gas and Electric Company
Street Lights Electricity Consumption	21,027	kWh	Pacific Gas and Electric Company
Park Lights Electricity Consumption	2,568	kWh	Pacific Gas and Electric Company
Total Public Lighting Electricity Consumption	**181,883**	**kWh**	

Table A-5: Jackson 2005 Baseline Potable Water and Wastewater Energy Use by Energy Source

Energy Source	Value	Units	Data Source
Wastewater Treatment Electricity Consumption	658,409	kWh	Pacific Gas and Electric Company
Potable Water Pumps Electricity Consumption	11,194	kWh	Pacific Gas and Electric Company
Total Potable Water and Wastewater Electricity Consumption	**669,603**	**kWh**	

APPENDIX B: JACKSON BUSINESS AS USUAL ENERGY USE FORECAST

The business as usual (BAU) community-wide energy use was forecasted using the Statewide Energy Efficiency Collaborative Clear Path California forecasting tool. Municipal energy use, because it is included within the non-residential energy use, was not forecasted separately. Residential energy use was forecasted using actual change in population for Jackson as reported by the California Department of Finance and projected growth in population for Jackson from the Amador County Transportation Commission's UPlan projections. Non-residential energy use was forecasted to stay flat by 2020 because there is no anticipated non-residential growth within the City limits, based on UPlan projections.

Annualized growth rates for the projected Jackson population and non-residential square footage were calculated for the Clear Path California time periods required to forecast energy use, reported in Table B-3. Annualized growth rates for each time period were calculated using the standard formula.

$$\text{Annualized Growth Rate} = (X/Y)^{\wedge(1/(Z)-1))-1}$$

Where: X = Forecast End Year Energy Use

Y = Baseline Year Energy Use

Z = Number of Years in the Forecast

Table B-1: BAU Residential Energy Use Forecast by Energy Source

Energy Source	2005 Residential Energy Use	2020 Residential Energy Use	2005-2020 Change in Energy Use
Electricity (kWh)	14,419,782	15,843,975	1,424,193
Natural Gas (Therms)	834,814	917,270	82,456
Propane (Gallons)	49,490	54,380	4,890
Fuel Oil/Kerosene (Gallons)	5,676	6,232	556
Wood (Cords)	213	235	22

Table B-2: BAU Non-Residential Energy Use Forecast by Energy Source

Energy Source	2005 Non- Residential Energy Use	2020 Non-Residential Energy Use	2005-2020 Change in Energy Use
Electricity (kWh)	31,193,516	31,193,516	0
Natural Gas (Therms)	665,276	665,276	0

Table B-3: Clear Path California BAU Energy Use Forecast Annualized Growth Rates

Energy Use Sector	Growth Indicator	Growth Indicator Source	Annualized Growth Rate (2005-2009)	Annualized Growth Rate (2010-2014)	Annualized Growth Rate (2015-2020)
Residential	Population	California Department of Finance and Amador County Transportation Commission's UPlan projections	0.010716	0.001959	0.006987
Non-Residential	Square Footage	Amador County Transportation Commission's UPlan projections	0	0	0

Table B-4: BAU Residential Energy Use Forecast Growth Indicators and Annualized Growth Rates

Year	Population	Growth Indicator Source
2005	4,408	California Department of Finance
2010	4,638	
2013	4,613	Amador County Transportation Commission's UPlan projections
2020	4,843	
Time Period	**Annualized Growth Rate**	
2005-2010	0.010224	California Department of Finance
2010-2013	-0.001800	
2013-2025	0.006987	Amador County Transportation Commission's UPlan projections

APPENDIX C: POTENTIAL ENERGY REDUCTION CALCULATIONS

This appendix shows the calculations for potential energy reductions resulting from implementation of each energy efficiency strategy. For each strategy, each step of the calculation is numbered, calculation inputs are highlighted in yellow and results are highlighted in green. Potential energy savings were not calculated for non-utility fuels because of their limited use in Jackson and the uncertainty surrounding efficiency programs for non-utility fuels.

Strategy 1.1: Expand outreach and education to increase participation in voluntary home energy-efficiency programs.		
Target: 20% of Existing Households Reduce Electricity Use 30% and Natural Gas use 15% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Residential Energy Use	14,419,782	kWh Electricity
	834,814	Therms Natural Gas
3. Baseline Number of Households	2,086	Housing Units
4. 2020 Target Percent of Households Participating	20%	of existing homes
5. 2020 Target Percent Energy Reduction From Baseline Year	30%	of electricity use
	15%	of natural gas use
2020 Participating Households = Baseline Households x Percent Participating =	417	Housing Units
2020 Electricity Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	865,187	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	25,044	Therms / Year

Strategy 1.2: Expand outreach and education to increase participation in voluntary non-residential energy-efficiency programs.		
Target: 20% of Existing Businesses Reduce Electricity Use by 30% and Natural Gas Use by 15% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Non-Residential Energy Use	31,193,516	kWh Electricity
	665,276	Therms Natural Gas
3. Baseline Non-Residential Square Footage	1,676	Thousand Square Feet
4. 2020 Target Percent Participating	20%	of existing square footage
5. 2020 Target Percent Energy Reduction From Baseline	30%	of electricity use
	15%	of natural gas use
2020 Participating Businesses = Non-Res Sq Footage x Percent Participating =	335	Thousand Square Feet
2020 Electricity Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	1,871,611	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Participating x Percent Reduction =	19,958	Therms / Year

Strategy 2.1: Improve compliance with Title 24 Green Building and Energy Efficiency Standards.		
Target: 100% of New Construction meets Title 24 Green Building and Energy Efficiency Standards		
1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase (Without Title-24 Compliance)	Residential	
	648,116	kWh / Year Electricity
	37,530	Therms / Year Natural Gas
3. Projected New Housing Construction (UPLAN)	49.28%	Single Family
	50.72%	Multi-Family
4. Percent of Residential Energy Use Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2004 CEC)[1]	Electricity	Natural Gas
	37%	88%
5. 2008 Title 24 Energy Savings Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2008 CEC)[2]	Electricity	Natural Gas
Single Family (SF)	22.7%	10%
Multi-Family (MF)	19.7%	7%
6. Percent of Residential Energy Use Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2010 CEC)[3]	Electricity	Natural Gas
	32%	86%
7. 2013 Title 24 Energy Savings Associated with Space Heating, Cooling, Indoor Lighting and Water Heating (2013 CEC)[4]	Electricity	Natural Gas
Single Family (SF)	36.4%	6.5%
Multi-Family (MF)	23.3%	3.8%
2020 Energy Savings from <u>2008</u> Title 24: = Forecast 2014-to-2020 Energy Use x Percent Covered Energy Use x [(Percent SF x 2008 SF Percent Savings) + (Percent MF x 2008 MF Percent Savings)] =	Residential	
	50,786	kWh / Year Electricity
	2,800	Therms / Year Natural Gas
2020 Energy Savings from <u>2013</u> Title 24: = (Forecast 2014-to-2020 Energy Use - 2008 Title 24 Energy Savings) x Percent Covered Energy Use x [(Percent SF x 2013 SF Percent Savings) + (Percent MF x 2013 MF Percent Savings)] =	Residential	
	22,589	kWh / Year Electricity
	1,532	Therms / Year Natural Gas
2020 Energy Savings from <u>2008 and 2013</u> Title 24: = 2008 Title 24 Energy Savings + 2013 Title 24 Energy Savings =	Residential	
	73,376	kWh / Year Electricity
	4,332	Therms / Year Natural Gas

[1] 2004 CEC (http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07 IMPACT ANALYSIS.PDF)
[2] 2008 CEC (http://www.energy.ca.gov/reports/400-04-009/2004-08-17_400-04-009ES.PDF)
[3] 2010 CEC (http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF)
[4] 2013 CEC (http://www.energy.ca.gov/2013publications/CEC-400-2013-008/CEC-400-2013-008.pdf)

Strategy 2.2: Provide incentives for buildings to exceed the current Title 24 Energy Efficiency Standards.		
Target: 15% of New Construction Reduces Energy Use 30% Beyond Title 24 Requirements		
1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase Without Title 24 Compliance	Residential	
	648,116	kWh / Year Electricity
	37,530	Therms / Year Natural Gas
3. 2020 Energy Savings from 2008 and 2013 Title 24 Compliance (See Strategy 2.1)	Residential	
	73,376	kWh / Year Electricity
	4,332	Therms / Year Natural Gas
4. Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance	Residential	
	574,740	kWh / Year Electricity
	33,198	Therms / Year Natural Gas
4. 2020 Target Percent Participation	15%	Residential
5. 2020 Target Percent Energy Savings	30%	Residential
2020 Energy Savings Beyond Title 24 Requirements: = Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance x Percent Participation x Percent Energy Savings =	Residential	
	25,863	kWh / Year Electricity
	1,494	Therms / Year Natural Gas

Strategy 3.1: Evaluate the City's residential, non-residential and municipal solar potential and assess barriers to increased solar energy use.		
Target: 20% of Existing Households and 20 Businesses Install Solar PV by 2020		
1. Baseline Year	2005	
2. 2020 Target Potential Installations	2,086	Residential
	Unknown	Non-Residential
3. Number of Existing Installations (2013 PG&E)[1]	50	Residential
	2	Non-Residential
4. Total kW of Existing Installations (2013 PG&E)	302	kW Residential
	180	kW Non-Residential
5. 2020 Target Percent Participating	20%	Residential Households
	20	Non-Residential Installations
6. Average Hours of Electricity Production (2014 CSI)[2]	4.70	Hours / Day
2020 Number of Participants = Potential Installations x Percent Participating =	417	Residential
	20	Non-Residential
2020 kW Solar Installed = Number of Participants x Total Size of Existing Installations / Number of Existing Installations (Non-Res uses Amador County average) =	2,520	kW Residential
	605	kW Non-Residential
2020 Solar-Produced Electricity = 2020 kW Solar Installed x Average Hours per Day Production x 365 Days / Year =	4,322,868	kWh / Year Residential
	1,037,646	kWh / Year Non-Res

Progress-to-Date (2013):		
Number of Solar Installations (2005 - 2013)	41	Residential Systems
	180 kW	Non-Residential kW
Annual Energy Production-to-Date (kWh/Yr) = Number Installations x kW per Installation x Hours per Day Production x 365 Days / Year =	424,826	kWh / Year Residential
	308,790	kWh / Year Non-Res

[1] PG&E Energy Summary for Jackson 2005 to 2013
[2] http://www.csi-epbb.com/default.aspx

Strategy 3.3: Encourage new development projects to meet 70% of their energy needs from renewable resources.		
Target: 15% of New Developments Meet 70% of Energy Need with Renewable Energy by 2020		
1. Baseline Year	2005	
2. Forecast 2014-to-2020 Energy Use Increase After Title 24 Compliance (See Strategy 2.2)	Residential	
	574,740	kWh / Year Electricity
	33,198	Therms / Year Natural Gas
3. Forecast 2014-to-2020 New Construction	108	Households
4. 2020 Target Percent Participating	15%	Residential
	15%	Non-Residential
5. 2020 Target Percent Provided by Renewables	70%	Residential
	70%	Non-Residential
2020 Non-renewable Energy Savings = Forecast Energy Use Increase After Title 24 Compliance x Percent Participating x Percent Provided by Renewables =	Residential	
	60,348	kWh / Year Electricity
	3,486	Therms / Year Natural Gas

Strategy 4.1: Improve the energy efficiency of existing municipal structures.		
Target: Reduce Energy Use in Municipal Buildings by 20% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Municipal-Operations Energy Use	312,325	kWh Electricity
	9,217	Therms Natural Gas
3. 2020 Target Percent Energy Reduction	20%	of energy use
2020 Electricity Savings = Baseline Energy Use x Percent Reduction =	62,465	kWh / Year
2020 Natural Gas Savings = Baseline Energy Use x Percent Reduction =	1,843	Therms / Year

Strategy 4.2: Evaluate cost-effectiveness of improving energy efficiency of traffic signals and public lighting.		
Target: Reduce Energy Used by the City for Public Lighting by 20% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Municipal-Operations Energy Use Street Lights and Other Lighting	181,883	kWh Electricity
3. 2020 Target Percent Energy Reduction	20%	of energy use
2020 Street and Other Lighting Savings = Baseline Energy Use x Percent Reduction =	36,377	kWh / Year

Strategy 4.3: Evaluate the feasibility of improving the energy efficiency of the potable water and wastewater infrastructure.		
Target: Reduce Energy Used by the City for Wastewater and Potable Water Treatment Systems by 20% by 2020		
1. Baseline Year	2005	
2. Baseline Annual Municipal-Operations Energy Use		
Potable Water	11,194	kWh Electricity
Wastewater	658,409	kWh Electricity
3. 2020 Target Percent Energy Reduction	20%	Potable Water
	20%	Wastewater
2020 Potable Water Systems Energy Savings = Baseline Energy Use x Percent Reduction =	2,239	kWh / Year
2020 Wastewater Systems Energy Savings = Baseline Energy Use x Percent Reduction =	131,682	kWh / Year

Strategy 5.1: Encourage residents and businesses to conserve water used indoors.		
Target: 100% of Households and Businesses Reduce Indoor Water Use by 20% by 2020		
1. Baseline Year	2005	
2. Baseline Year Population	4,408	People
3. Amador Water Agency (AWA) 2005 System Average Gallons Per Capita Per Day (GPCD)	185	Gallons / Capita / Day
4. Percent of Urban Water Demand (2013 CA WPU)[1]	31%	Residential Indoor
	45%	Landscape Irrigation
	20%	Non-Residential
5. 2020 Target Percent Reduction in Indoor Water Use	20%	Reduction
6. Energy Use Factor - Tanner Water Treatment Plant (July 2013 - June 2014)	315,015	kWh
	2,545	Acre-Feet
	124	kWh / Acre-Foot
7. Energy Use Factor - Jackson Municipal Operations (2005)	11,194	kWh
	913	Acre-Feet
	12	kWh / Acre-Foot
8. Gallons Per Acre-foot Conversion	325,851	Gallons / Acre-foot
2005 Combined Potable Water Energy Use Factor = Tanner WTP Energy Use Factor + Jackson Potable Water Energy Use Factor =	136	kWh / Acre-Foot
2005 Estimated Indoor Water Use = Total GPCD x (Percent Res + Percent Non-Res) =	94	Gallons / Capita / Day
2005 Estimated Annual Indoor Water Use = Indoor GPCD x Baseline Year Population * 365 Days Per Year / Gallons Per Acre-foot Conversion =	466	Acre-Feet / Year
2020 Reduced Indoor Water Use = Annual Indoor Water Use x Percent Reduction =	93	Acre-Feet / Year
2020 Energy Savings from Reduced Indoor Water Use = Reduced Indoor Water Use x Combined Energy Use Factor =	12,674	kWh / Year

[1] 2013 California Water Plan Update: http://www.waterplan.water.ca.gov/docs/cwpu2013/2013-prd/Vol3_Ch03_UrbanWUE_PubReviewDraft_Final_PDFed_co.pdf

Strategy 5.2: Encourage residents and businesses to conserve water used outdoors.		
Target: 100% of Households and Businesses Reduce Landscape Water Use by 20% by 2020		
1. Baseline Year	2005	
2. Baseline Year Population	4,408	People
3. Amador Water Agency (AWA) 2005 System Average Gallons Per Capita Per Day (GPCD)	185	Gallons / Capita / Day
4. Percent of Urban Water Demand (2013 CA WPU)[1]	31%	Residential Indoor
	45%	Landscape Irrigation
	20%	Non-Residential
5. 2020 Target Percent Reduction in Indoor Water Use	20%	Reduction
6. Energy Use Factor - Tanner Water Treatment Plant (July 2013 - June 2014)	315,015	kWh
	2,545	Acre-Feet
	124	kWh / Acre-Foot
7. Energy Use Factor - Jackson Potable Water System (Municipal Operations 2005)	11,194	kWh
	913	Acre-Feet
	12	kWh / Acre-Foot
8. Gallons Per Acre-foot Conversion	325,851	Gallons / Acre-foot
2005 Combined Potable Water Energy Use Factor = Tanner WTP Energy Use Factor + Jackson Potable Water Energy Use Factor =	136	kWh / Acre-Foot
2005 Estimated Outdoor Water Use = Total GPCD x (Percent Landscape Irrigation) =	83	Gallons / Capita / Day
2005 Estimated Annual Outdoor Water Use = Outdoor GPCD x Baseline Year Population * 365 Days Per Year / Gallons Per Acre-foot Conversion =	411	Acre-Feet / Year
2020 Reduced Outdoor Water Use = Annual Outdoor Water Use x Percent Reduction =	82	Acre-Feet / Year
2020 Energy Savings from Reduced Outdoor Water Use = Reduced Outdoor Water Use x Combined Energy Use Factor =	11,183	kWh / Year

[1] 2013 California Water Plan Update: http://www.waterplan.water.ca.gov/docs/cwpu2013/2013-prd/Vol3_Ch03_UrbanWUE_PubReviewDraft_Final_PDFed_co.pdf

APPENDIX D: EXISTING ENERGY EFFICIENCY PROGRAMS, POLICIES AND CODES IN JACKSON

EXISTING PROGRAMS/POLICIES/CODES	DESCRIPTION
EXISTING PROGRAMS	
▪ Pacific Gas & Electric Company (PG&E)	PG&E offers incentives, rebates and educational resources to residents, businesses, non-profits and government agencies in Jackson. (http://www.pge.com/)
▪ Sierra Business Council (SBC)	SBC administers the Sierra Nevada Energy Watch program, delivering cost effective energy-efficiency projects and benchmarking services to businesses, non-profits, and government agencies in Jackson. SBC also offers consulting services to governments on energy and climate planning. (http://sierrabusiness.org/)
▪ Amador Tuolumne Community Action Agency	ATCCA works to help individuals in Amador and Tuolumne towards self-sufficiency, assist local residents in becoming more involved and contributing members of the community, promote family environments, and form healthy partnerships within the community to help satisfy the aforementioned needs. (http://www.atcca.org)
▪ Amador Water Agency	AWA provides water to all of Amador County, and offers water-efficient fixtures for free as a resource for its customers. (www.amadorwater.org)
▪ GRID Alternatives	GRID Alternatives is a nonprofit organization that brings the benefits of solar technology to communities that would not otherwise have access, providing needed savings for families and preparing workers for jobs in the fast-growing solar industry. (http://www.gridalternatives.org/)
▪ TRC Energy Services	TRC Energy Services administers the California Advanced Homes program, which highlights best practices in energy efficiency, green building and sustainability, and offers generous financial incentives to help builders and architects create environmentally friendly, energy-efficient communities for potential home buyers. (http://cahp-pge.com/)
▪ Electric Vehicle Charging Stations	Through a grant from California City Jackson has two stations up and running. One is at the Civic Center at 33 Broadway, and the other is across the highway from the Fire Station in the old Mel & Faye's location next to the rest rooms.

EXISTING PROGRAMS/POLICIES/CODES	DESCRIPTION
EXISTING POLICIES: GENERAL PLAN (as updated 2012)	
▪ Land Use Element (2008)	A balanced mix of housing, workplaces, shopping, recreational opportunities, and institutional uses, including mixed-use structures (combined residential and non-residential uses), that help to reduce vehicular trips shall be encouraged. (Policy 1.8, p. 16)
	To increase pedestrian access, development standards shall be created which require the installation of sidewalks for new development. (Policy 4.2, p.18)
▪ Housing Element (2007-2014)	The City will continue to partner with Pacific Gas & Electric to promote energy saving programs by notifying home builders of the design tool offered by PG&E and by posting a link on the City's website to notify ratepayers of the variety of programs. (Program 5.1.3, p. 67)
	The City shall promote the reduction of energy use and the conservation of natural resources in the development of housing. (p. 70, program 5.1.1)
ARCHITECTURAL REGULATIONS (2001)	
▪ Design Standards that Apply to All Projects (Chapter 2)	….. Solar access should be considered for natural lighting. (2.3.2(j), p. 2-5)
	Solar exposure and orientation. (2.3.4, p.2-7). Lists development standards for maximizing solar access.
▪ Design Standards for specific land uses (Chapter 9)	Lighting reduction and energy-efficient timer systems shall be required after normal business hours except for lighting that is mandated for general safety and security. (9.9.10(h), p. 22)
	Landscape Design Plans shall incorporate a mix of indigenous and native plants that are hardy and drought tolerant, and shall include a minimum of 40% evergreen plantings (trees, shrubs, groundcovers, ornamental grasses, and evergreen herbs). Permanently installed irrigation systems are required.(9.9.6(a)(3), p. 19)
Municipal Code *(Current as of April 2014)*	
▪ Title 17 – Development Code	Solar Access and Solar Equipment Guidelines - Development standards to maximize passive heating and cooling opportunities in residential developments. (17.30.140, p.27)
	Street Trees –Lists development standards for street trees for residential and non-residential development, including trees for shading. (17.40.050, pp. 72-75)

APPENDIX E: PG&E AND OTHER ENERGY EFFICIENCY PROGRAMS

This appendix lists programs and rebates currently offered by PG&E and other organizations, as of the publishing of the EAP. A full description of current incentives programs can be found online.

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
RESIDENTIAL PROGRAMS	
▪ Home Upgrade	PG&E's Home Upgrade program offers rebates of up to $2,500 to help homeowners focus on their building shell to maintain a warmer or cooler indoor environment while lowering energy bills. Improvements may include attic, wall and floor insulation, duct sealing, furnace and AC replacements, and more.
▪ Advanced Home Upgrade	PG&E's Advanced Home Upgrade program offers rebates up to $6,500 to go beyond building shell upgrades and is typically more complex, involving deep improvements. A Home Upgrade Professional will conduct a comprehensive energy assessment using energy-modeling software to create a customized energy-saving plan for your home.
▪ SmartAC™	PG&E's SmartAC program offers the opportunity to help prevent summer energy supply emergencies from disrupting day to day activities. Upon joining, SmartAC will install their free SmartAC device. Once installed, the customer will receive a SmartAC reward check.
▪ SmartRate™	PG&E's SmartRate program gives a discount at 3¢ per kWh on the customer's June through September monthly rate, or the equivalent of 23% off Tier 1 usage. In exchange, the customer pays a surcharge of 60¢ per kWh for 2-7PM usage between 9 and 15 PG&E SmartDays™, May through October. With SmartRate automatic bill protection, the first summer is risk free.
▪ Home Appliance Rebate	PG&E offers residential customers rebates on the purchase of Energy Star® home appliances. Rebates on cooling systems range from $20-$425, heating systems from $100-$500 and appliances from $50-$75.
▪ Solar Water Heating	PG&E's Solar Water Heating program provides incentives up to $2,719 based on the expected performance of the system.
▪ Federal Renewable Energy Tax Credit	A taxpayer may claim a credit of 30% of qualified expenditures for a renewable energy system that serves a dwelling unit located in the United States that is owned and used as a residence by the taxpayer. Expenditures include labor costs for on-site preparation, assembly or original system installation, and piping or wiring to interconnect a system to the home.
▪ California Advanced Homes	California Advanced Homes™ Program, administered by PG&E and TRC Energy Services, highlights best practices in energy efficiency, green building and sustainability, and offers generous financial incentives to help builders and architects create environmentally friendly, energy-efficient communities for potential home buyers.

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
▪ New Solar Homes Partnership (NSHP)	The NSHP provides financial incentives and other support to home builders, encouraging the construction of new, energy efficient solar homes that save homeowners money on their electric bills and protect the environment.
TARGETED RESIDENTIAL PROGRAMS	
▪ Home Energy Assistance Program (HEAP)	HEAP provides financial assistance to income-qualified applicants in the form of an annual utility credit for gas, electric, propane or firewood to help with the high costs of heating and/or cooling. HEAP programs in Jackson are administered by Amador Tuolumne Community Action Agency (ATCAA).
▪ Emergency Crisis Intervention Program (ECIP)	ECIP provides financial assistance in the event of a crisis, such as a 48-hour shut-off notice. ECIP programs in Jackson are administered by Amador Tuolumne Community Action Agency (ATCAA).
▪ Weatherization Assistance Program (WAP)	WAP provides free weatherization services and products to improve a home's energy efficiency and reduce overall utility costs, including attic insulation, weather stripping, caulking, minor home repairs and related conservation measures. WAP programs in Jackson are administered by Amador Tuolumne Community Action Agency (ATCAA).
▪ Relief for Energy Assistance through Community Help (REACH)	REACH provides grants for projects that reduce energy vulnerability such as PG&E's one-time emergency financial assistance.
▪ California Alternate Rates for Energy (CARE)	Qualified low-income customers that are enrolled in the CARE program receive a 30-35 percent discount on their electric and natural gas bills. CARE is administered by PG&E.
▪ Family Electric Rate Assistance (FERA)	The FERA program provides a monthly discount on electric bills for income-qualified households of three or more persons. FERA is administered by PG&E.
▪ Energy Savings Assistance Program	The Energy Savings Assistance Program provides income-qualified customers with energy-saving improvements at no charge. The program is administered by PG&E.
▪ Medical Baseline Allowance	Residential customers with a qualified physician certified medical condition can receive additional quantities of energy at the lowest (baseline) price. The program is administered by PG&E.
▪ Multi-Family	PG&E's Multi-Family Program is for property owners and managers of existing residential dwellings or mobile home parks with five or more units. The program encourages owners to install qualifying energy-efficient products in individual tenant units and common areas of residential apartments, mobile home parks and condominium complexes. A full list of available rebates and incentives is available online.
▪ Single Family Affordable Solar Housing (SASH)	The California Solar Initiative SASH program provides qualifying low-income homeowners up-front rebates to defray the costs of installing a solar electric system. Depending on the income level, homeowners may be eligible for an entirely free system, or a highly

ENERGY EFFICIENCY PROGRAMS	DESCRIPTION
	subsidized one. The SASH program is administered by GRID Alternatives.
NON-RESIDENTIAL PROGRAMS	
▪ Sierra Nevada Energy Watch Program (SNEW)	SNEW, administered by Sierra Business Council, delivers cost effective-energy efficiency projects to businesses, non-profits, and governments in the Sierra Nevada region including Amador County.
▪ PG&E Rebates and Incentives	PG&E offers non-residential customers rebates and incentives for power management software, occupancy sensors on lights, steam traps, HVAC motors and pumps, electric water heaters, process cooling, data center airflow management, boiler economizers, refrigeration, boiler heat recovery, refrigeration control, VSD pumps, boilers and fans. A full list of current rebates can be found using the PG&E money back tool. (www.pge.com/businessrebates)
▪ HVAC Quality Maintenance Program	PG&E's Commercial HVAC Quality Maintenance Program offers generous incentives for enrolling in a three-year air conditioning quality maintenance service agreement and installing optional unit retrofits. The business owner will lower their operating, repair and replacement costs; optimize unit performance and efficiency; improve the indoor air quality and thermal comfort for employees and customers; help prevent HVAC unit failures that can threaten business operations; and reduce their carbon footprint.
▪ Lighting Rebates	PG&E offers rebates for high-efficient replacement lights as well as rebates to help cover the costs of qualifying fixtures and retrofit kits.
▪ Federal Business Investment Tax Credit	A taxpayer may claim an investment tax credit of 30% of qualified expenditures for solar, fuel cells, small wind systems or 10% of qualified expenditures for geothermal, microturbines and combined heat and power systems (CHP), aka co-generation systems. Expenditures include labor costs for on-site preparation, assembly or original system installation, and for piping or wiring to interconnect a system.
▪ Savings By Design (SBD)	SBD is a statewide program offered by PG&E to encourage high-performance new building design and construction for commercial buildings. The program offers building owners and their design teams a wide range of services, such as design assistance, design team incentives, owner incentives, and educational resources.
▪ Retrocommissiong (RCx) Program	Retrocommissioning (RCx) is a systematic process for identifying less-than-optimal performance in your facility's equipment, lighting and control systems and making the necessary adjustments. While retrofitting involves replacing outdated equipment, RCx focuses on improving the efficiency of what's already in place. PG&E's RCx Program provides incentives and connects businesses with experts to make sure their facilities — and the equipment and systems within them — are running in peak condition for optimal energy savings. RCx projects can improve a facility's work environment and extend the service life of equipment.

APPENDIX F: ENERGY EFFICIENCY FINANCING PROGRAMS

This appendix lists available financing programs for specific sectors (community-wide, residential, non-residential, and municipal).

FUNDING SOURCE	DESCRIPTION
COMMUNITY-WIDE	
▪ Property Assessed Clean Energy (PACE)	PACE is a means of financing energy efficiency upgrades or renewable energy fixtures on existing structures. In areas under PACE legislation, municipal governments offer a specific bond to investors and then turn around and loan the money to consumers and businesses looking to fund a retrofit. Loans are typically paid out over an assigned term of 15-20 years via an annual assessment on the property tax bill. It can also be used to finance leases and power-purchasing agreements (PPA's) for solar power or other renewable energy providers. (http://energycenter.org/policy/property-assessed-clean-energy-pace)
▪ Solar Power Purchase Agreement (PPA)	A solar power purchase agreement (PPA) is a financial agreement where a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little to no cost. The developer sells energy to the host customer at a fixed rate that is typically lower than the local utility's retail rate. The lower price offsets the purchase of grid electricity while the developer receives the income from these sales of electricity as well as any tax credits and other incentives generated from the system.
RESIDENTIAL	
▪ Energy Star Energy Efficiency Mortgages	An Energy Efficient Mortgage (EEM) is a mortgage that credits a home's energy efficiency in the mortgage itself. EEMs give borrowers the opportunity to finance cost-effective, energy-saving measures as part of a single mortgage and stretch debt-to-income qualifying ratios on loans thereby allowing borrowers to qualify for a larger loan amount and a better, more energy-efficient home. https://www.energystar.gov/index.cfm?c=mortgages.energy_efficient_mortgages
▪ CHF Residential Energy Retrofit Program	Through the California Home Finance Authority (CHF) Residential Energy Retrofit Program, eligible homeowners can finance energy efficiency and renewable energy measures, up to $50,000, with a 6.5% fixed interest rate 15-year loan. http://www.chfloan.org/programs/energy/overview.shtml
NON-RESIDENTIAL	
▪ PG&E Energy Efficiency Financing	PG&E offers 0% interest loans of up to $100,000. Loans can be used to replace old and inefficient equipment with no up-front out-of-pocket investment. The program allows 5 years for repayment; however, the energy savings continue to accrue after the loan is paid off. http://www.pge.com/en/mybusiness/save/rebates/onbill/index.page
▪ Energy Savings Agreement	An Energy Savings Agreement involves a financing contract with a private energy services company that packages energy efficiency as a service paid through the energy savings. It allows for 100% financing and is off balance sheet.
▪ SAFE-BIDCO	SAFE-BIDCO offers small businesses, qualifying landlords, and non-profit organizations loans up to $450,000 for a maximum of 15 years to complete energy

FUNDING SOURCE	DESCRIPTION
	efficiency and renewable energy projects. The loan can cover energy studies, design and consultant fees, materials and equipment costs and loan fees. http://www.safe-bidco.com/loan-programs/energy-efficiency-loans/
MUNICIPAL	
▪ CEC Energy Efficiency Financing	The California Energy Commission (CEC) offers school districts, charter schools, county offices of education, state special schools, community college districts 0% loans for energy efficiency and energy generation projects. CEC offers cities, counties, special districts, public colleges, universities and public care institutions/hospitals 1% loans for energy efficiency and energy generation projects. http://www.energy.ca.gov/efficiency/financing/
▪ PG&E Energy Efficiency Financing	PG&E offers 0% interest loans of up to $250,000. Loans can be used to replace old and inefficient equipment with no up-front out-of-pocket investment. The program allows 10 years for repayment; however, the energy savings continue to accrue after the loan is paid off. http://www.pge.com/en/mybusiness/save/rebates/onbill/index.page
▪ Energy Savings Agreement	An Energy Savings Agreement involves a financing contract with a private energy services company that packages energy efficiency as a service that is paid through the energy savings. It allows for 100% financing and is off balance sheet.
▪ CSCDA Sustainable Energy Bond Program	California Statewide Communities Development Authority (CSCDA) and the Foundation for Renewable Energy and Environment are teaming together to provide public agencies and nonprofit organizations throughout California with access to tax exempt financing for critical sustainable energy investments. Under the Sustainable Energy Bond Program, participating entities and organizations will contract with an Energy Service Company (ESCO) to complete energy and water conservation measures. Improvements could include street lighting, building lighting, pumps, HVAC, system controls, boilers, chillers, ducting, windows, partial roofing, toilets and others. The program participants will receive substantial utility cost savings, including a contractual guarantee sufficient to cover the full cost of all retrofit work. All projects are financed through tax exempt bonds. http://www.cacommunities.org/energy-finance-programs/
▪ IBank Clean Energy Finance Center	The California Infrastructure and Economic Development Bank (IBank) Clean Energy Finance Center (CEFC) encourages concerted public and private investments and utilizes IBank's access to capital markets for selected clean energy and energy efficiency projects. The IBank CEFC will help to drive energy related projects for State and local governments. http://ibank.ca.gov/clean_energy.htm

APPENDIX G: PUBLIC OUTREACH

Throughout development of the Energy Action Plan (EAP) public outreach was a key part of the process. To this effort, two publicly noticed study sessions were hosted and an online survey was released to collect public input on the EAP and the identified Goals, Strategies and Actions. In addition there were two public hearings: one each before the Planning Commission and City Council prior to approval of the EAP. The Council voted unanimously to approve the EAP. A variety of methods were used to 'spread the word' about the study sessions and survey including newsprint articles, radio announcements, multiple email blasts to local contacts, postings on the City's website, and invitations to electeds, the Chamber and other local organizations and businesses. The three communities of Jackson, Plymouth and Amador County decided to host joint study sessions. A summary of the public input is described below.

Joint Study Session 1: August 19, 2014

The first joint study session summarized work performed by Sierra Business Council (SBC) for Jackson, Plymouth and Amador County in 2010 – 2014. For each community, the work included an inventory of energy used community-wide and by municipal operations for base year 2005, and a forecast of future usage to Year 2020. A series of charts and graphic displays were provided as well as handout materials summarizing the work done to date.

While turnout was low a number of excellent comments were made that helped inform the next phase of the process – development of the goals, strategies and actions. A summary of the key comments is provided below.

Comments from Joint Study Session 1: August 19, 2014

Topic	Comment
General	Do a per capita comparison between the JPAC communities
	Were LS-1 costs included for Jackson?
	Why are lighting costs for Plymouth more than Jackson?
Actions	Focus on existing development; not a lot of new development anticipated
	Promote energy monitoring systems – they are very effective
	Should show energy usage on E-Bills
	Increase awareness of new technologies
	Find ways or develop programs to reduce upfront costs for energy efficiency installs; this is a barrier particularly for fixed-income residents
	Find ways/programs to finance individual renewable energy projects (homes/small business); financing is largest barrier to increasing this type of energy efficiency program
	Look at code updates to make solar permitting easier
	Find funding to incentivize code updates
	Make realtors aware of the 203K Program
	Utilize community events (fairs, farmer's markets) to spread word about energy efficiency programs
	Get the word out to people about new PGE buy/back policy

Joint Study Session 2: November 12, 2014

The purpose of the second joint study session was to review and receive input on the draft goals, strategies and actions for the EAP. As discussed, the goals provide the overall framework for the EAP while the strategies and actions provide specific steps and metrics to measure progress toward accomplishing the goals.

Despite a low turnout it was a very productive discussion. The main 'takeaways' are enumerated below.

Comments from Joint Study Session 2: November 12, 2014

Topic	Comment
Goal 2 Strategies	- Need to have good cost savings/payback examples - Reach out to contractor's clients and encourage them to ask for above Title 24 energy requirements - Include a link in appendices to PGE's class/training schedule - Could attach something to the building or development permit application informing applicants of Title 24 energy requirements, energy efficiency programs, etc. - Outreach to local BIA chapter, HOAs and other community groups
Outreach	- Work with staff on contacting local individuals/organizations with large email/contact lists to help 'spread the word' on the EAP - Education is one of the more effective outreach methods with locals - Need to get information on energy efficiency out to community before building plans are finalized - Potential for creating community champions for energy efficiency/sustainability; possible leads in local restaurant/SNEW customers - Local example: one business owner changed out all light fixtures on his lot with LED's, saving $3000/year
Barriers	- How permits are processed for Title 24 varies between jurisdictions, but in some can pay a fee to get "expedited process." However, expedited permitting in Jackson, Plymouth and Amador County is not feasible. - Water conservation problematic in cities with aging infrastructure – which most cities have! Requires tremendous capital outlay to correct

Online Survey

In an effort to expand outreach to local residents and businesses, Sierra Business Council developed an on-line survey to garner input on the proposed goals, strategies and actions. A series of questions about each strategy topic were asked and respondents were provided multiple choices for an answer plus an opportunity to provide additional written comments. A summary of the survey responses follows; the full survey is available at the City's Planning Department.

Online Survey Summary for Jackson, Plymouth and Amador County
Activated October 24, 2014; Closed December 15, 2014

Respondent Profile: ▪ 45 total responses ▪ 73% from unincorporated area ▪ 91% were 45 or older ▪ 75% were 55 or older	
Survey Questions	**Responses**
Promote energy efficiency	94% yes
Are proposed strategies effective	85% yes
Offer incentives for projects exceeding Title 24 energy requirements	79% yes
Offer incentives for renewable energy projects	83% yes
Prioritize municipal energy efficiency and renewable energy projects	88% yes City should prioritize. Focus should be: ▪ Small scale roof top solar ▪ Greywater usage LED lighting
Promote water conservation	94% yes
Offer incentives for projects exceeding Title 24 water efficiency requirements	77% yes
Obtaining information to make a decision about an energy efficiency project in home/business	Top two ways: ▪ Contractor quotes ▪ Average costs (note: for water efficiency, two top ways were case studies and average costs)
Accessing information about energy efficiency programs, rebates, etc.	Top three sources: ▪ Seminars/Workshops ▪ Mailers ▪ Website (note: for water efficiency, info at city offices was in top 3)
Additional Comments (partial list)	▪ Pursue: Solar, energy saving appliances (assistance), grants for storm windows, home evaluations, gas subsidies, workshops, assistance for elderly, solar federal and state grants ▪ Give residents information on window, door, and attic weather treatments to help keep heat in, or out, from those ▪ Seek positive reinforcements like block-grants; fees, fines and punitive taxes, not so much. ▪ Educating the public is vital ▪ Should not mandate any more programs that cost; let existing mandated programs 'catch up with the budget.' Let the free market prevail. ▪ Local government must be the leaders and role models ▪ You questionnaire was structured to get a desired answer/outcome and I do not respect that approach