# 4.13 ENERGY

This section contains an analysis of the impacts the 2030 General Plan may have on energy in Live Oak and the surrounding region, as it applies to the City, as well as local actions to conserve and use energy more efficiently. This section provides a description of existing energy use and expected trends for future use, as well as a brief analysis of regulations and plans pertinent to the implementation of the 2030 General Plan.

## 4.13.1 REGULATORY SETTING

Local, State, and federal agencies, as well as energy suppliers, routinely conduct programs to make the public aware of the need for energy conservation and sustainability. The increased and growing demands for non-renewable energy supplies are best addressed through conservation according to these programs and their requirements.

### FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

### U.S. Congress

Beginning in the late 1990s, Congress introduced a tax subsidy on the production of renewable wind-generated electricity. The availability, expiration, and potential extension of the Production Tax Credit causes the boom and bust production of energy that typifies wind development in the United States. The Production Tax Credit's limitations have determined the role of the wind energy industry in the United States, and contributed to the dominance of electric utility subsidies.

Congress also periodically directs federal agencies to use increasing amounts of renewable energy or otherwise aid private companies in developing wind energy. One example is the U.S. Department of Energy's Wind Powering America initiative, which, among other tasks, has created Wind Working Groups in each state with a wind resource.

#### *National Energy Act*

The National Energy Act of 1978 was a legislative response by the U.S. Congress to the 1973 energy crisis. It includes the following statutes:

- Public Utility Regulatory Policies Act (PURPA) (Public Law 95-617)
- Energy Tax Act (Public Law 95-318)
- National Energy Conservation Policy Act (NECPA) (Public Law 95-619)
- Power Plant and Industrial Fuel Use Act (Public Law 95-620)
- Natural Gas Policy Act (Public Law 95-621)

Some of the more important legislative acts are briefly summarized below.

#### *Public Utility Regulatory Policies Act*

The Public Utility Regulatory Policies Act (PURPA) was passed by Congress in 1978 as part of the National Energy Act to promote greater use of renewable energy. This law created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

### *Energy Tax Act*

The Energy Tax Act (Public Law 95-318) was also passed by Congress in 1978 as part of the National Energy Act. It was a response to the 1973 oil crisis and promoted fuel efficiency and renewable energy through taxes and tax credits.

### *National Energy Conservation Policy Act*

The National Energy Conservation Policy Act (NECPA [Public Law 95-619]) was signed into law in 1978 as part of the National Energy Act. NECPA requires utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand. NECPA was amended in 1985 by the Energy Policy and Conservation Act Amendments of 1985 (Public Law 99-58).

## U.S. Department of Energy

The U.S. Department of Energy is responsible for energy policy and nuclear safety. Its purview includes the nation's nuclear weapons program, nuclear reactor production for the U.S. Navy, energy conservation, energy-related research, radioactive waste disposal, and domestic energy production.

### *Federal Energy Management Program*

The U.S. Department of Energy's Federal Energy Management Program works to reduce the cost and environmental impact of the federal government by advancing energy efficiency and water conservation, promoting the use of distributed and renewable energy, and improving utility management decisions at federal sites.

### *Energy Policy Act*

The Energy Policy Act of 1992, executive orders, and presidential directives require federal agencies to meet a number of energy and water management goals, among other requirements. For example, federal agencies are called upon to reduce their energy use by 35% by 2010 in comparison to 1985 levels. The Energy Policy Act of 2005 (U.S. House of Representatives HR 6), was signed into law on August 8, 2005, reestablishing a number of federal agency goals and amending portions of NECPA.

## Federal Energy Regulatory Commission

FERC regulates and oversees energy industries in the economic, environmental, and safety interests of the American public. FERC is the federal agency with jurisdiction over interstate electricity sales, wholesale electric rates, hydroelectric licensing, natural gas pricing, and oil pipeline rates. FERC also reviews and authorizes liquefied natural gas terminals, interstate natural gas pipelines, and nonfederal hydropower projects.

## STATE PLANS, POLICIES, REGULATIONS, AND LAWS

## State CEQA Guidelines

Appendix F, Energy Conservation, of the CEQA Guidelines describes the energy conservation information and analyses that may be included in an EIR. This includes a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of natural gas and oil. Appendix F of the Guidelines provides the basis for the thresholds used for determining the significance of impacts in this EIR. For a list of specific issues that will be addressed in this analysis, please refer to the Thresholds of Significance, listed later in this document.

### California Energy Commission

Established in 1974 by the Warren-Alquist Act (Public Resources Code Section 25000 et seq.), the California Energy Commission (CEC) is the state's primary energy policy and planning agency. The commission has five major responsibilities, which are listed below:

- forecasting future energy needs and keeping historical energy data;
- licensing thermal power plants 50 MW or larger, promoting energy efficiency through appliance and building standards;
- developing energy technologies and supporting renewable energy; and
- planning for, and directing the state response to an energy emergency.

### Title 24 Energy Efficiency Standards

Title 24 energy standards, the energy efficiency standards for residential and nonresidential buildings, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.

The CEC has adopted changes to the Building Energy Efficiency Standards, to accomplish the following:

- to respond to California's energy crisis to reduce energy bills, increase energy delivery system reliability, and contribute to an improved economic condition for the state;
- to respond to the AB 970 (Statutes of 2000) urgency legislation to adopt and implement updated and cost-effective building energy efficiency standards;
- to respond to various statutes of 2001, which included urgency legislation to adopt energy efficiency building standards for outdoor lighting; and,
- to emphasize energy efficiency measures that save energy at peak periods and seasons, improve the quality of installation of energy efficiency measures, incorporate recent publicly funded building science research, and collaborate with California utilities to incorporate results of appropriate market incentives programs for specific technologies.

In addition, the 2007 California Green Building Standards Code (California Code of Regulations, Title 24, Part 11) is scheduled to become mandatory in 2010 and requires buildings to reduce energy and water consumption by 15 and 20 percent, respectively, as well as reduce landscape water consumption by 50 percent. The code also requires that new residential buildings reach zero net energy use by 2020, and new commercial buildings achieve this goal by 2030.

### State of California Energy Plan

The CEC identifies emerging trends in energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy in the State Energy Plan. The plan calls upon the state to reduce congestion and increase the efficient use of fuel supplies. The plan also encourages urban designs that reduce vehicle miles traveled and accommodate pedestrian and bicycle access.

### California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In September 2006, Governor Schwarzenegger signed AB 32 (Chapter 488, Statutes of 2006), the California Global Warming Solutions Act of 2006, which enacted Sections 38500–38599 of the California Health and Safety Code. AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in greenhouse gas (GHG) emissions and a cap on statewide GHG emissions. The mechanisms for reducing GHG emissions will relate to the generation and efficient use of energy.

AB 32 requires reduction of statewide GHG emissions to 1990 levels by 2020 (an approximately 25% reduction in existing statewide GHG emissions). This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012.

In October of 2008, the California Air Resources Board (ARB) published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. The Proposed Scoping Plan contains the main strategies California will implement to achieve GHG reductions consistent with AB 32. The largest proposed GHG reductions are recommended from improving emission standards for light-duty vehicles, implementation of the Low-Carbon Fuel Standard, energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems, and a renewable portfolio standard for electricity production. ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the Proposed Scoping Plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions since local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions.

### Senate Bill 375

Senate Bill (SB) 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. (This legislation amended Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 66587, and 65588 and added Sections 14522.1, 14522.2, and 65080.01 to the California Government Code; amended Section 21061.3 and added Section 21159.28 and Sections 21155 through 21155.3 to the Public Resources Code.) Like AB 32, this legislation closely relates to the use of energy resources in California.

SB 375 requires metropolitan planning organizations (MPOs) to adopt a sustainable-communities strategy (SCS) or alternative-planning strategy (APS) keyed to the land-use allocation in that MPO's regional transportation plan (RTP). CARB, in consultation with MPOs, will provide each affected region with emissions reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. The legislation aligns the program for the regional distribution of housing to be consistent with the RTP. SB 375 provides new streamlining provisions to CEQA for projects consistent with the SCS or APS and provides a new CEQA exemption for qualifying transit priority residential and mixed-use residential projects.

## Regional and Local Plans, Policies, Regulations, and Ordinances

### Sutter County General Plan

The existing Sutter County General Plan, adopted in 1996, includes the following goal and policy related to energy. The existing General Plan also includes goals and policies relevant to natural gas extraction activities occurring in the County.

**GOAL 4.G:** To conserve energy resources in Sutter County.

- **Policy 4.G-1:** The County shall encourage energy conserving land use forms and practices—such as compact, high density development projects; the provision of bikeways and pedestrian paths; proper solar orientation; and the incorporation of transit routes and facilities.

### City of Live Oak General Plan

The City's existing General Plan, originally adopted in 1994, did not include policies specific to energy or energy conservation in Live Oak. The 2030 General Plan includes extensive policies and programs to address energy and energy conservation. The most recent version of the City's Housing Element, adopted in June 2009, includes several policies intended to promote energy conservation as it pertains to housing within the City. Those goals, policies, and implementation programs are listed below.

**GOAL F.1:** To promote energy conservation.

- **Policy F.1:** Continue to implement state energy efficiency standards.

- **Policy F.2:** Seek funding to provide weatherization assistance to low-income households.

- **Program F.1:** Implement State Energy Conservation Standards

  The City will continue to require applicants for building permits to demonstrate compliance with the state energy conservation requirements at the time building plans are submitted.

- **Program F.2:** Energy Conservation Assistance for Low-Income Households

  The City will include weatherization and energy conservation as eligible activities under its housing rehabilitation program. The City will provide information and refer eligible property owners to other programs offered by Pacific Gas & Electric and nonprofit organizations. The City will promote weatherization and energy efficiency home improvement options through general advertisement of its housing rehabilitation program. The City will also refer interested individuals to energy rebate and conservation assistance programs offered by others and maintain information on these programs at City Hall. Information on other energy conservation and weatherization programs will be included in City mailings and advertisements of its housing rehabilitation program.

## 4.13.2 ENVIRONMENTAL SETTING

As of 2006, California ranked second in total energy consumption of natural gas, petroleum, and retail electricity sales, following only Texas in each category (EIA 2006). Despite being a large consumer of energy, in particular transportation energy, per-capita consumption rate for all these energy sources combined is one of the lowest in the country, and ranks 48th. This is largely due to California's government energy efficiency programs and mild weather, which reduces the energy demand for heating and cooling (EIA 2009).

### TRANSPORTATION ENERGY USE

The transportation sector makes up the single largest consumer of energy in California, accounting for 41% of the state's total energy demand, and nearly all of this energy is provided by petroleum. There are several factors that make the state's energy demand for transportation high. Californians have a large number of registered vehicles (the highest in the nation), long average commute times, high average rate of vehicle miles traveled (VMT), major transportation fuel consumers (i.e., major airports and military installations), among other factors (CEC 2007a).

The high levels of VMT in California are often attributed to the distribution of land uses and development patterns, which vary from those found in other parts of the country, and tend to be more spread out with more separation between different types of land uses (CEC 2007b). In the early part of the 20th Century, development patterns were relatively compact. Communities tended to be walkable and mixed housing in with retail and commercial services. More recently developed areas (such as many parts of California), by contrast, have lower density development patterns spread over large land areas, with scattered employment opportunities. When land uses are not mixed and development patterns have lower densities, people usually become dependent on automobiles for access to jobs and services (U.S. EPA 2001). Today, many Live Oak residents travel outside of the Planning Area for jobs and commercial services. Many residents have commutes to Yuba City, Chico, Placer County, Sacramento, and other areas.

### ELECTRICITY

When cities and counties consider the effects of their long-range land use planning relative to electricity demand, it is important to keep in mind that electricity demand varies substantially according to the types of operations within buildings, type of construction materials used in a building, whether buildings are reused or built anew, the efficiency of all electricity consuming devices within a building, and the local climate. In addition, private and public purveyors of energy resources, including Pacific Gas & Electric (PG&E), which provides electricity and natural gas to the entire Planning Area, have established long-standing energy conservation programs to encourage consumers to adopt energy conservation habits, install energy efficient appliances in their homes, and reduce energy consumption during peak demand periods.

Due to the nature of electricity distribution, it is often difficult to determine exact electricity demand for a specific geographic area, such as the Live Oak Planning Area. In addition, PG&E has opted to keep demand statistics for the Planning Area confidential (City of Live Oak 2006). However, the CEC maintains demand records for counties and some local jurisdictions, as well as for utility providers, like PG&E. Since PG&E's service area is very large and covers a variety of different geographic areas and climate types, which can largely determine electricity demand, the service area is broken up into five climate zones for the purposes of analyzing demand and forecasting future electricity use. Live Oak is located in Zone 3, which covers the Central Valley region, with the exception of the greater Sacramento region, which has its own climate zone for these purposes (CEC 2007c).

Total electricity demand in PG&E's service area was 85,075 gWh in 2007. Commercial uses made up the largest portion of this demand (34,864 gWh total: 30,655 gWh for Commercial Buildings and 4,209 gWh for Commercial Other), while Residential uses followed closely behind the total of the commercial uses (30,846 gWh) (CEC 2008). In 2007, PG&E's Zone 3 had a total consumption of 8,177 gWh (CEC 2007c), less than 10% of PG&E's total consumption. The CEC anticipates that annual growth rates in the amount of electricity consumed in Zone 3 will be 0.7% between 2006 and 2018, and that total consumption in the region will reach 9,447 gWh by 2018 (CEC 2007c).

In 2005, Sutter County had an overall electricity demand of 568 gigawatt hours (gWh), with approximately 55% from non-residential uses and the remaining 45% generated by residential uses (Sutter County 2008). In 2007, the demand increased to 596 gWh (CEC 2008). Table 4.13-1 below estimates Sutter County's electricity demand through buildout of the 2030 General Plan, assuming the CEC's estimated annual growth rate of 0.7%. This table also provides CEC's estimates of projected total electricity consumption in PG&E's Zone 3.

For the 2030 General Plan, it is not possible to know in detail exactly what types of housing and businesses will be developed. For example, smaller houses use less energy than larger homes, so energy demands would be lower if the Planning Area is developed with a higher proportion of smaller homes. Similarly, certain types of businesses are more energy intensive than others. A grocery store, for example, would tend to have a higher electricity demand than would a warehouse of the same square footage. Factors such as building design and materials, the presence and design of landscaping, and operating practices all affect electricity demand.

| Table 4.13-1<br>Forecasted Electricity Demand for Sutter County & PG&E Zone 3 | | | |
|---|---|---|---|
| Year | Annual Growth Rate | Sutter County Total Projected Consumption (gWh)[a] | PG&E Zone 3 Total Projected Consumption (gWh)[b] |
| 2007 | 0.7% | 596 | 8,177 |
| 2008 | | 600 | 8,298 |
| 2009 | | 604 | 8,403 |
| 2010 | | 609 | 8,512 |
| 2011 | | 613 | 8,631 |
| 2012 | | 617 | 8,749 |
| 2013 | | 621 | 8,866 |
| 2014 | | 626 | 8,980 |
| 2015 | | 630 | 9,097 |
| 2016 | | 635 | 9,214 |
| 2017 | | 639 | 9,332 |
| 2018 | | 644 | 9,447 |
| 2019 | | 648 | n/a |
| 2020 | | 653 | n/a |
| 2021 | | 657 | n/a |
| 2022 | | 662 | n/a |
| 2023 | | 666 | n/a |
| 2024 | | 671 | n/a |
| 2025 | | 676 | n/a |
| 2026 | | 680 | n/a |
| 2027 | | 685 | n/a |
| 2028 | | 690 | n/a |
| 2029 | | 695 | n/a |
| 2030 | | 700 | n/a |

Sources: California Energy Commission, 2007c and 2008, and EDAW 2009.

Notes: Projected total consumption for Sutter County was calculated by EDAW using CEC data on Sutter County estimated electricity consumption and the estimated annual growth rate of 0.7% for PG&E Zone 3. Data was provided in Form 1.9b – PG&E Planning Area California Energy Demand 2008–2018 Staff Revised Forecast Peak Demand and Consumption Forecast by Climate Zone. The estimated annual growth rate of 0.7% may not apply to these data. Data are not available beyond the year 2018.

## NATURAL GAS

In 2006, natural gas provided approximately one-third of California's total energy requirements, led only by petroleum, which provided 46% of the total energy (CEC 2007a). California's total consumption of natural gas in 2006 was 2,331 trillion British thermal units (btu) (EIA 2006), or 23,315,566,711 (23,316 million) therms.[1] To compare, PG&E used 4,527.68 million therms, and 19.93 million therms were consumed within Sutter County in

[1] A therm is a unit of heat used to measure natural gas equal to 100,000 btu or the amount of energy used to burn 100,000 cubic feet of natural gas.

2007 (CEC 2008). Average annual household natural gas consumption was estimated at 538 therms (CEC 2007a). PG&E did not provide specific usage statistics natural gas for the City of Live Oak or the Planning Area.

Forecasts for natural gas use in PG&E's service area indicate an average annual growth rate between 2008 and 2018 of approximately 0.4%. Total consumption is expected to reach 5,163 million therms by 2018. Of this, nearly 44% is expected to serve the residential sector (CEC 2007c).

Table 4.13-2 below estimates Sutter County's natural gas demand through 2030, assuming the CEC's estimated annual growth rate of 0.4% and provides CEC's estimates of projected total natural gas consumption in PG&E's Natural Gas Planning Area. Like electricity, the demand for natural gas can vary dramatically depending on factors like building design and materials, building size, use, and efficiency of the natural gas equipment.

**Table 4.13-2**
**Forecasted Natural Gas Demand for Sutter County & PG&E Natural Gas Planning Area**

| Year | Annual Growth Rate | Sutter County Total Projected Consumption (therms, millions)[a] | PG&E Natural Gas Planning Area Total Projected Consumption (therms, millions)[b] |
|---|---|---|---|
| 2007 | 0.4% | 19.93 | 4,961 |
| 2008 | | 20.01 | 4,985 |
| 2009 | | 20.09 | 5,015 |
| 2010 | | 20.17 | 5,038 |
| 2011 | | 20.25 | 5,064 |
| 2012 | | 20.33 | 5,082 |
| 2013 | | 20.41 | 5,100 |
| 2014 | | 20.49 | 5,114 |
| 2015 | | 20.58 | 5,131 |
| 2016 | | 20.66 | 5,144 |
| 2017 | | 20.74 | 5,155 |
| 2018 | | 20.82 | 5,163 |
| 2019 | | 20.91 | n/a |
| 2020 | | 20.99 | n/a |
| 2021 | | 21.08 | n/a |
| 2022 | | 21.16 | n/a |
| 2023 | | 21.24 | n/a |
| 2024 | | 21.33 | n/a |
| 2025 | | 21.41 | n/a |
| 2026 | | 21.50 | n/a |
| 2027 | | 21.59 | n/a |
| 2028 | | 21.67 | n/a |
| 2029 | | 21.76 | n/a |
| 2030 | | 21.85 | n/a |

Sources: California Energy Commission, 2007c and 2008, and EDAW 2009.
Notes: Projected total consumption for Sutter County was calculated by EDAW using CEC data on Sutter County estimated natural gas consumption and the estimated annual growth rate of 0.4% for the PG&E Natural Gas Planning Area. Data was provided in Table 39 – PG&E Natural Gas Planning Area Natural Gas Consumption by Sector (10^6 Therms) California Energy Demand 2008–2018 Staff Revised Forecast Peak Demand and Consumption Forecast by Climate Zone. The estimated annual growth rate of 0.4% may not apply to these data. Data may vary from other estimates. Data are not available beyond the year 2018.

### Natural Gas Resources

There are no producing natural gas wells in or in the area immediately the Live Oak Planning Area, so development implemented as part of the 2030 General Plan would not affect these resources. Due to the distribution of well locations primarily southwest of the Sutter Buttes, it is unlikely that future natural gas wells would be developed within the Planning Area.

Sutter County has extensive natural gas resources, and on average, produces between 12 and 16 mcf (thousand cubic feet) of natural gas each year. In 2006, Sutter County produced 25 mcf of natural gas, which was approximately 3% of California's total natural gas production that year. In all, according to the California Geological Survey, there were 922 natural gas wells located in Sutter County in 2007, although only 293 were complete productive wells. The vast majority of these natural gas wells and the natural gas reserves in the County are located in the west, near the boundary with Colusa County, generally southwest of the Sutter Buttes near the communities of Meridian and Sutter (Sutter County 2008).

## 4.13.3 Environmental Impacts and Mitigation Measures

### Thresholds of Significance

For the purpose of this analysis, the following applicable thresholds of significance have been used to determine whether implementing the proposed project would result in a significant impact. These thresholds of significance are based on Appendix F of the State CEQA Guidelines. An impact on energy resources or conservation is considered significant if implementation of the proposed project would do any of the following:

- results in wasteful, inefficient, and unnecessary consumption of energy during construction, operatic, and maintenance of the project;
- the siting and orientation of buildings and structures do not minimize energy consumption, including transportation energy;
- does not include measures for reducing peak energy demand;
- does not include incorporation of alternative fuels (particularly renewable ones) or energy systems; and
- does not include incorporation of recycling of non-renewable resources.

### Impact Analysis

IMPACT 4.13-1 *Implementation of the General Plan would allow for a large amount of urban development, which would increase the demand and consumption of energy. However, the General Plan includes policies intended to establish efficient land use patterns and efficient use of energy in areas of land use change. This impact is less than significant.*

This 2030 General Plan accommodates the development of up to 18,000 housing units in the Planning Area through 2030, as well as up to 6.4 million square feet (sf) of building space in mixed-use development, up to 750,000 sf of commercial uses, and up to 2.5 million sf of employment (largely light industrial and job-creating uses), all of which would increase Live Oak's energy consumption, requiring that additional energy resources be delivered to City residents by PG&E. Table 4.13-3 and Table 4.13-4 below estimate the increases in electricity and natural gas use that would result from full buildout of the 2030 General Plan.

| Table 4.13-3<br>Estimated Additional Monthly Electricity Demand from 2030 General Plan Implementation | | | |
|---|---|---|---|
| Land Use | Use Factor (kWh/ ksf or du/year) | Proposed du/ksf | Additional Demand at Buildout (kWh/year) |
| Residential | 7,067 | 18,000 du | 127,206,000 |
| Mixed-Use/Commercial/Retail/Light Industrial/Employment | 16,750 | 9,650 ksf | 161,637,500 |
| **Total** | | | **288,843,500** |
| Notes: kWh = kilowatt hours; du = dwelling units; ksf = thousand square feet.<br>Source of Generation Factors: California Energy Commission [CEC] 2000. California Energy Demand Staff Report P200-00-002. | | | |

| Table 4.13-4<br>Estimated Additional Monthly Natural Gas Demand from 2030 General Plan Implementation | | | |
|---|---|---|---|
| Land Use | Use Factor (therms/du or ksf/year) | Proposed du/ksf | Additional Demand at Buildout (therms/year)) |
| Residential | 419 | 18,000 du | 7,542,900 |
| Commercial/Retail/Light Industrial/Employment | 375 | 9,650 ksf | 3,618,750 |
| **Total** | | | **11,161,650** |
| du = dwelling units; ksf = square feet.<br>Source of Generation Factors: California Energy Commission [CEC] 2000. California Energy Demand Staff Report P200-00-002. | | | |

As shown in the table, full buildout of the 2030 General Plan would result in an estimated increase of approximately 289 million kWh for electricity and 11 million therms of natural gas each year, in addition to the City's existing demand. The generation rates are based on California-specific data and are averaged based on size of the residential unit and different types of non-residential uses. These estimates are based on generalized demand rates because more specific estimates are not possible at the General Plan level. PG&E will need to consider the future generation of electricity and natural gas with careful consideration of the anticipated peak usage for their service areas. Individual development projects proposed under the General Plan would be required to go through the environmental review process, which would assess whether PG&E can accommodate the energy needs of that project. Additionally, new developments would be required to comply with the current energy performance standards found in Title 24, as well as policies in the General Plan that address energy conservation.

## Relevant Policies and Programs of the 2030 General Plan

Please refer to the City's Land Use, Circulation, and Community Character Elements, which include strategies to reduce vehicular travel and promote alternatives to vehicular travel. In addition to energy use by the transportation sectors, the City has also addressed energy use in buildings and other structures. To reduce energy use and promote conservation, the 2030 General Plan contains the following policies and programs.

- **Policy Energy-1.1:** The City will encourage new developments to use building orientation and site design that optimizes opportunities for on-site solar generation. The City will encourage new developments to use street and lot orientation and lot dimensions that facilitate the use of solar energy and climatically appropriate design.

- **Policy Energy-1.2:** The City will encourage new developments to orient as many buildings as possible with the longer axis of the building, also known as the ridge line, oriented east-to-west, in order to maximize the potential for passive solar heating in the winter and to minimize heat gain from the afternoon summer sun.

- **Policy Energy-1.3:** Shade trees or other appropriate plantings should be used in new lower-density residential development (e.g., trellises) to protect buildings from unwanted solar gain in summer months. Trees and plantings should be located on the east and west sides of each home. Shade trees should be located at an appropriate distance from buildings to provide adequate shading, while reducing potential damage to buildings. Shade trees need to be located so that active and passive solar energy systems are not diminished. Using deciduous trees on the southern side of the structure is encouraged, to allow cooling in the summer and solar gain in winter.

- **Policy Energy-1.4:** Development plans should demonstrate preservation of solar access for residential buildings within and adjacent to the project. The City will waive this requirement in medium-density and higher-density residential projects and mixed-use projects if needed to achieve the densities allowed by the General Plan.

- **Policy Energy-1.5:** New buildings should enhance natural ventilation and promote effective use of daylight, to reduce use of energy. Designs should emphasize ventilation strategies such as natural convection and push-pull ventilators. Structures should be designed to provide abundant natural light through high-performance glazing systems, skylights, light ducts, light shelves, and other strategies.

- **Policy Energy-1.6:** The City will also provide incentives, such as expedited permitting or density bonuses to developers that design and construct net zero energy residential prior to 2020, and commercial and institutional buildings prior to 2030.

- **Policy Energy-1.7:** New City-owned buildings and major remodels and additions should be designed to achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) certification or better, where funding allows. Financial analysis of both first costs and long-term operational costs should guide the City's evaluation of LEED certification.

- **Policy Energy-1.8:** The City will promote Build-it-Green or LEED–Homes certification of new single-family properties.

- **Policy Energy-1.9::** The City will promote LEED or equivalent certification of multiple-family, commercial, and industrial properties.

- **Policy Energy-1.10:** The City will provide incentives, such as expedited permitting or density bonuses to development with over 75 percent of the units achieving LEED-certification or equivalent performance standards achieving these performance standards.

- **Policy Energy-1.11:** The City will encourage energy efficiency audits of existing buildings and help facilitate the implementation of identified efficiency improvements. The City will conduct energy efficiency audits of all City-owned buildings.

- **Policy Energy-1.12:** The City will encourage the retrofitting of existing buildings throughout Live Oak with energy efficient systems, energy-efficient appliances, insulation, energy-efficient doors and windows, and other elements that conserve resources.

- **Policy Energy-1.13:** New commercial, institutional, and industrial development should reduce potential urban heat island effect by using U.S. Environmental Protection Agency–ENERGY STAR®-rated roofing materials and light colored paint, using light-colored paving materials for internal roads and parking, and by using shade trees to shade south and west sides of new or renovated buildings, to the greatest extent feasible.

- **Policy Energy-1.14:** New commercial, institutional, and industrial development shall incorporate shade trees or shade structures in any newly constructed surface parking areas. The minimum requirement is 50 percent shading (at maturity where trees are used) for all new parking lots.

- **Policy Energy-2.1:** The City will explore the installation of renewable energy systems on City buildings and properties.

- **Policy Energy-2.2:** New construction or major renovation of commercial and industrial buildings over 10,000 square feet shall incorporate renewable energy generation, where feasible, to provide for the project's energy needs.

- **Policy Energy-2.3:** The City will maximize the use of renewable energy in meeting City building energy needs with a goal of 50 percent or more renewable energy by General Plan buildout.

- **Policy Energy-2.4:** The City will evaluate the operational cost-savings and feasibility of installing solar hot water systems to heat the community swimming pool.

- **Implementation Program Energy-1:** The City will create permitting-related and other incentives for energy-efficient building projects. These should include, but are not be limited to giving projects that exceed Title 24 Standard by 10 percent or more priority in plan review, priority in processing and field inspection services, and density bonuses.

- **Implementation Program Energy-2:** Amend subdivision standards to ensure that street and lot orientation facilitates buildings that incorporate solar design and renewable energy systems. Street and lots shall be designed in a way that allows residential lots to accommodate a building's long axis in an east-west direction.

- **Implementation Program Energy-3:** The City will amend the zoning and subdivision ordinances to provide regulatory guidance for lot and building orientation to allow passive solar and renewable energy systems use.

- **Implementation Program Energy-4:** The City will proactive identify and take advantage, where possible, of state and federal grants, low-interest financing, and other funding mechanisms for energy efficiency retrofits and alternative energy projects for civic, residential, and commercial buildings.

- **Implementation Program Energy-5:** The City will allow solar financing programs designed to facilitate the installation of solar energy systems on residents' homes. Such programs would establish a sustainable energy financing district and would allow property owners to borrow money from the City to install solar energy systems. Property owners would voluntarily participate in the program and would repay the cost of the solar energy system over a 20-year period through a special annual tax on their property tax bill. Only property owners who participate in the program will pay the sustainable energy financing district tax. Non-participants would experience no change in taxes due to the program.

- **Implementation Program Energy-6:** The City will provide public outreach to support reduced energy consumption, the use of alternative and renewable energy sources, green building practices, recycling, and responsible purchasing.

Implementation of these policies would reduce energy use for new development compared to existing development and existing structures in the City and encourage the use of renewable energy sources for the City's energy needs. More specifically, these policies would ensure that new development projects use design features, building materials, and building practices that would increase the energy efficiency of new structures developed within the City and the Planning Area.

The 2030 General Plan establishes land use patterns and circulation systems that will accommodate a variety of travel modes. The land use diagram proposes to develop major employment and commercial centers in Live Oak,

which will enable both current and future residents to work and shop within the City, whereas at present, many residents drive to employment and commercial centers in other cities.

As noted in the 2030 General Plan Land Use Element, "one of the key land use issues facing Live Oak is the need to create employment opportunities for residents." The General Plan provides the overarching policy guidance that will help the City to better match the number and types of jobs available in the community with the size and skills of Live Oak's labor force during General Plan buildout.

The land use diagram also proposes the development of neighborhood and civic centers in residential areas, which would provide neighborhood services to residents of those areas. The centers are located so that most homes would be located within walking or biking distance of them. Along with the changes in the land use patterns, the General Plan proposes improvements to the City's circulation pattern, which include street improvements, bicycle/pedestrian paths, and improvements intended to make the City more pedestrian friendly. Policies intended to improve public transit services are also included.

In addition to the proposed policies, implementation of the revised California Title 24 standards would reduce the City's energy demand below the estimated demand listed above. Under the Title 24 standards, which will be fully mandated by 2010, the additional electricity demand generated by buildout of the Planning Area is estimated to be reduced to 220,568,120 kWh per year, a reduction of 68,275,380 kWh (nearly 24 percent) from the 288,843,500kWh estimated using current standards. Similarly, the natural gas demand would be reduced to 9,369,147 therms after compliance with Title 24 standards from the previously estimated 11,161,650 therms each year. This represents a reduction of 16 percent.[2]

## Conclusion

Several elements of the proposed General Plan include goals, policies, and implementation programs that would lead the City toward energy conservation and energy conservation both directly and indirectly. These goals, policies, and implementation programs can be found in the Conservation, Land Use, Circulation, Community Character, and Conservation and Open Space Elements. These policies, along with compliance with applicable regulations, would ensure that the Planning Area is developed using efficient land use and circulation patterns and energy conservation methods, thereby preventing the wasteful, inefficient, excessive, and unnecessary consumption of energy. Therefore, this impact is **less than significant**.

### Mitigation Measure

No mitigation beyond the 2030 General Plan policies and programs is required.

[2] EDAW 2009.