

## **4.12 ENERGY**

## 4.12 ENERGY

---

### **Energy – Environmental Setting**

This section addresses the energy sources and amounts produced in Sonoma County, as well as the local efforts to use energy more efficiently and conserve energy. Renewable energy sources in the county include solar, waste-to-energy, wind, hydroelectric, and geothermal. Some of these sources are used by the private sector to produce localized power. Information on non-renewable energy sources is also presented, though these facilities are located outside of the county at present. Methods of energy conservation are presented in relation to land use patterns; transportation; building construction and retrofit; County facilities and programs; agriculture, industry and water / wastewater; and solid waste reduction, reuse, and recycling. County, State, and federal regulatory oversight is explained.

#### **OVERVIEW**

CEQA requires that EIRs discuss the potential energy impacts of projects, including avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.<sup>1</sup> Energy conservation and efficiency goals can be achieved by:

- Decreasing overall per capita consumption;
- Decreasing reliance on fossil fuels such as natural gas and oil; and
- Increasing reliance on renewable energy sources.

The production and use of energy is closely tied to development. Patterns of land use and types of transportation systems strongly influence the need for and use of energy. By adopting general and other land use plans that establish land use patterns and circulation systems, the County can influence the amount of energy that will be used at the local level. The County regulates smaller, often renewable sources of power and can promote local energy independence by eliminating regulatory barriers to these types of technologies. The County can adopt energy conservation and efficiency standards that reduce the demand for energy.<sup>2</sup>

County residential, commercial, industrial, and agricultural uses in the unincorporated and incorporated areas of the County consume about 2,601,179 MWh/y.<sup>3 4</sup> The County produces some of

---

<sup>1</sup> *Guidelines for Implementation of the California Environmental Quality Act, Energy Conservation*, California Code of Regulations, Title 14, Division 6, Chapter 3, Appendix F.

<sup>2</sup> *Draft General Plan Guidelines*, State of California Governor's Office of Planning and Research, 2002.

<sup>3</sup> *MWh/y* means megawatt hours per year. A *megawatt* hour or *MWh* is 1,000 watt-hours, or 1 kilowatt-hour. A *watt*, *kilowatt*, and *megawatt* are measurements of power. A kilowatt-hour of energy is used if you turn on a 100-watt light bulb for ten hours.

its own power through the Central Landfill Power Plant (50,000 MWh/y), the hydroelectric facility at Warm Springs Dam (13,000 MWh/y), and a solar photovoltaic system on the roof of a County building (130 MWh/y).

The majority of the county's electricity is provided by Pacific Gas and Electric Company (PG&E). PG&E draws on a variety of energy sources to feed its regional power grids. The Geysers Geothermal Power Plants generate significant energy that supports the PG&E power supply. As a result, electricity sources in Sonoma County generate about twice as much electricity as is consumed in the county. However, since the county has no petroleum or natural gas production facilities, it is a net consumer of those energy sources.

It is useful to differentiate between energy efficiency and energy conservation. Energy efficiency means using less energy / electricity to perform the same function. Conservation connotes "doing without" in order to save energy rather than using less energy to do the same thing. For example, turning off lights, turning down the air conditioner, and making fewer vehicle trips are all conservation measures. Installing lighting that uses less electricity, installing additional insulation, and switching to a vehicle with better gas mileage are energy efficiency measures.<sup>5</sup>

## **ENERGY SUPPLY**

### **California State Energy Sources**

California's major sources of energy are petroleum (i.e., gasoline and oil), electricity, and natural gas. The California Energy Commission (CEC) indicates that California petroleum resources in 2001 came from in-state (49.4 percent), foreign sources (29.3 percent), and Alaska (21.3 percent). In 1999 natural gas resources in California came from the Southwest (46 percent), Canada (28 percent), in-state (16 percent), and the Rocky Mountains (ten percent). The gross electricity production by resource type in California in 2000 included natural gas at 38.10 percent, nuclear at 15.52 percent, and hydroelectric at 14.99 percent. Imports from the northwest and southwest added 6.69 percent and 2.85 percent, respectively, while geothermal was 4.8 percent, and biomass and waste accounted for 2.17 percent.

### **Sonoma County Energy Sources**

A study of the consumption of petroleum, natural gas, and electricity in Sonoma County between 1983 and 1994 revealed that mainstream average energy uses in the county during this period were petroleum (54 percent), natural gas (28.5 percent), and electricity (17.5 percent).<sup>6</sup> Use of these energy forms in the county climbed moderately over the ten year period; mainstream energy use increased by 30 percent as the population increased by 31 percent. Total petroleum consumption increased by 25 percent while per capita consumption fell, in part reflecting increased fuel efficiency in motor vehicles. Total natural gas consumption increased by 32.6 percent while per capita consumption remained steady. Total electricity use increased by 47.6 percent, reflecting increased per

---

<sup>4</sup> *Resource Conservation Element – Energy Resources*, CAC memo, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

<sup>5</sup> *Draft General Plan Guidelines 2002*, Governor's Office of Planning and Research, State of California, 2002.

<sup>6</sup> *Energy Use in Sonoma County, California*, Ilka M. Jerabek, Sonoma State University, 1996.

capita consumption. Sonoma County's main provider of electricity, PG&E, draws on a variety of state and local energy sources to feed its regional power grids, including geothermal, natural gas, hydroelectric, nuclear, oil, and coal.

The County General Services Department manages and maintains 1.5 million square feet of owned space and 350,000 square feet of leased space. The County-owned facilities use approximately 18.5 million kilowatt-hours per year (kWh/y) of electricity. Natural gas-fired boilers heat most complexes.

Constructed in 1993, expanded in 1996, and operated by the County Department of Transportation and Public Works, the power plant at the Central Landfill off Meacham Road generates six megawatts (MW) of electricity through combustion of methane gas from the landfill. The County uses a small fraction of the energy for on-site uses and sells the remainder to PG&E.

The Sonoma County Water Agency (Water Agency) uses large amounts of electricity, primarily to operate its water extraction pumps at its Wohler diversion facility along the Russian River; they use approximately 60,660 MWh of electricity annually. The Water Agency also operates a hydroelectric facility at Warm Springs Dam rated 2.6 MW. The annual electricity production of the facility is about 13,000 MWh. The Water Agency sells electricity from the hydroelectric facility to PG&E.

The use of fossil fuels such as gasoline, oil, natural gas, and coal generates emissions of greenhouse gases such as carbon dioxide, methane, oxides of nitrogen, and carbon monoxide that pollute and alter the composition of the atmosphere. This may contribute significantly to climate change (i.e., global warming). A 2002 study of the greenhouse gas emissions from Sonoma County governmental operations by Pacific Technology Associates revealed that the percent of greenhouse gas emissions are distributed as follows: building use (40.9 percent), employee commute (38.3 percent), fleet vehicles (20.3 percent), and water and sewer use (0.5 percent). Sonoma County has joined the Climate Protection Campaign sponsored by the International Conference on Local Environmental Initiatives (ICLEI) and will be setting targets for reducing these emissions, creating a plan for how to meet these targets, implementing the plan, and monitoring and adjusting as appropriate.<sup>7</sup>

### ***Private Energy Generation Facilities***

The main private energy generator in the county is the Geysers Geothermal Power Plants that total 1,122 MW and generate approximately five million MWh/y. Other private energy generation facilities at this time include small-scale solar photovoltaic (PV), hydroelectric, and wind systems used to generate power for some residences, agricultural operations, and commercial uses, particularly in the rural areas of the county.

## **ENERGY CONSERVATION AND EFFICIENCY**

There are many opportunities for County government, residents, and businesses to use energy wisely through conservation and efficiency programs. These opportunities include:

- Land use – following compact development and land use patterns;

---

<sup>7</sup> Resource Conservation Element – Energy Resources, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

- Transportation – decreasing reliance on cars and encouraging more walking, bicycling, and riding the bus;
- Building construction and retrofit – constructing more energy efficient homes and buildings;
- County facilities and operations – ensuring that County facilities and operations are as energy efficient as possible;
- Reduction of energy use in agricultural operations – continuing to take advantage of energy saving opportunities in agricultural operations;
- Reduction in solid waste – promoting solid waste reduction, recycling, and reuse programs; and
- Energy education.

### **Land Use**

The existing *General Plan* Land Use Element contains goals and objectives that encourage city and community centered growth, compact city and community boundaries, and the phasing of rural and urban growth with the availability of adequate services. The county's number of small communities and history of rural residential development allows many current residents to live in rural areas, however, not necessarily in compact land use patterns.

### **Transportation**

In California, 48 percent of all the energy used is for transportation; personal vehicles account for over 50 percent of all energy used in transportation statewide. The *Sonoma County Bikeways Plan* identifies goals, objectives, and policies for a county bikeways network, encouraging and facilitating commuting by bicycle, and increasing awareness of the benefits of bicycling and the rights and responsibilities of bicyclists.

Sonoma County Transit (SCT) celebrated 20 years of service in 2000. It provides intercity bus service in Sonoma County and local bus service in Rohnert Park, Cotati, Guerneville, Sebastopol, and Windsor. SCT operates nine local routes, three express routes, and ten intercity routes with a fleet of 58 buses, 40 of which are powered by natural gas from a natural gas fueling facility. In 2001 SCT provided bus service to 1.53 million riders.

Reducing fuel consumption by a government vehicle fleet will result in less air pollution and direct economic savings through decreased fuel purchases. Sonoma County Fleet Operations has four hybrid electric vehicles, three neighborhood electric vehicles, and compressed natural gas vehicles (currently not in operation) in its fleet.

### **Building Construction and Retrofit**

Design and retrofit measures can make a building more energy efficient. The County Waste Management Agency has prepared *New Home Construction Green Building Guidelines* an educational guide for local builders, in addition to the Sonoma County Green Products Showcase.<sup>8</sup>

### **County Facilities and Programs**

Government operations consume a large amount of energy. Government agencies tend to have long term occupancy, creating a positive opportunity for returns from long-term energy investments; and have the opportunity to set an example regarding the application of energy conservation and efficiency practices.

The County has contracted with Brown, Vance & Associates (BVA) to provide strategic planning and consulting to assist the County in a wide variety of energy related areas. The scope of work includes preparing a County Strategic Energy Plan for County operations that would contain an energy profile; energy goals and objectives; strategies for energy policies, energy projects, power contracts, inter-agency cooperation, formation of a municipal utility district, facility operations and maintenance changes, changes to design guidelines, and employee education; evaluation of these strategies; and a schedule for implementation.<sup>9</sup>

Sonoma County has several existing programs and projects related to energy conservation and efficiency: Under the *Sustainable Policies and Practices Project*, the County develops indicators to monitor energy use in County internal operations and implements energy conserving design guidelines for new County buildings. The County has goals to increase the use of renewable energy sources and increase recycling opportunities at the County Center Complex, and to certify Fleet Operations and Reprographics as *Sonoma Green Businesses*. The County has goals to decrease the use of City water by using campus on-site wells for irrigation.

Some of the specific projects include:

- An Energy Conservation Campaign that includes an Energy Conservation Employee Suggestion Award Program and an Energy website for County employees;
- Installation of a more energy efficient system for chilling water at the Central Mechanical Plant;
- Insulation of the roof of the existing Juvenile Hall and installation of R30 rated roofs in all new and retrofitted County buildings;
- Addition of electric and hybrid electric vehicles to the County's vehicle fleet; and
- Energy efficiency improvements at the Geyserville, Russian River, Airport-Larkfield-Wikiup, and Sonoma Valley wastewater treatment plants.

---

<sup>8</sup> *Sonoma Waste Management Agency*, Sonoma Waste Management Agency, [online] available <http://www.recyclenow.org>, August 2003.

<sup>9</sup> Resource Conservation Element – Energy Resources, Lisa Posternak, Sonoma County PRMD, November 21, 2002.

### ***Agriculture, Industry, Water Supply, and Wastewater Treatment***

Agriculture, industry, and water supply and wastewater treatment operations consume approximately one-third of the electricity used in California. Energy represents the largest controllable cost of providing water or wastewater services to the public. Similar to other energy users, agriculture faces the challenge of enhancing productivity while sustaining its resource base and protecting the environment. In Sonoma County, agriculture is a key component of the economy and environment. Because energy costs affect profits directly, farmers are often highly aware of the energy costs associated with their operations in general and with individual pieces of machinery in particular. Public and private funding is available to leverage the costs of farm productivity improvements.<sup>10</sup>

### ***Solid Waste Reduction, Reuse, and Recycling***

Energy is used to manufacture the products that eventually become waste. Recovery of recyclable material from municipal solid waste can both save energy and extend the life of landfills. The Sonoma County Waste Management Agency is a joint powers authority of the nine cities and the County of Sonoma. The focus of the Agency's efforts is the implementation of regional waste diversion programs as required by State law. The Agency's responsibilities include administration of a regional composting program, household hazardous waste program, waste reduction education and information services, and business recycling programs. The *Countywide Integrated Waste Management Plan* includes the objective of achieving a 50 percent diversion of wastes being disposed of in county landfills by the year 2003, and a 70 percent diversion rate by 2015, based on 1990 rates.<sup>11</sup>

### ***Energy Education***

A 1988 California Energy Commission (CEC) study of the effectiveness of educational programs in conserving energy showed that information campaigns, audits of energy use or direct feedback on energy consumption, and financial incentives generate about 15 to 29 percent energy savings. The CEC offers cash rebates on eligible renewable energy electric-generating systems, including photovoltaics, small wind turbines, fuel cells, and solar thermal electricity systems.<sup>12</sup>

The Sonoma County Economic Development Board (EDB) has formed the Business Environmental Alliance (BEA), a public-private partnership working to promote the voluntary adoption of good environmental practices by local businesses and farms. A focus group of the BEA has looked at energy and water supplies in the County as well as opportunities for encouraging conservation measures. Their recommendations include educating Sonoma County business owners and their employees about the current energy and water supply situations and reducing their resource consumption, creating easily accessible information for businesses to learn more about conservation measures, and taking steps to streamline the process of participating in resource conservation programs.

---

<sup>10</sup> California Energy Commission, [online] <http://www.energy.ca.gov/process/agriculture/>, December 2002.

<sup>11</sup> *Countywide Integrated Waste Management Plan*, Sonoma County Waste Management Agency, October, 2003.

<sup>12</sup> *Renewable Energy Buydown Program*, California Energy Commission website, [online] <http://www.consumerenergycenter.com/buydown/>, December 2002.

The Sonoma County Department of Emergency Services administers the *Sonoma County Green Business Program*, which recognizes businesses that have taken steps to reduce their energy and water consumption.<sup>13</sup> The County's North County Detention Facility and heavy equipment Fleet Operations have been certified as *Sonoma Green Businesses*. The County is working to certify the County Administration Complex as a green business.

Sonoma County set a national precedent in August, 2002 when all of its cities and the County pledged to reduce greenhouse gas emissions.<sup>14</sup> Each jurisdiction will measure the amount of greenhouse gas it produces, set a target for reducing it, develop and implement a local action plan, and monitor its progress. Measurements reveal that the County's governmental operations now produce about 37,000 tons of greenhouse gas per year. The County has set a goal of reducing greenhouse gas emissions by 20 percent from 2000 to 2010.<sup>15</sup>

## **RENEWABLE ENERGY SOURCES**

### **Solar Energy**

Solar energy technology directly converts sunlight into usable energy, either electricity or direct heating of water or space. Photovoltaic (PV) solar facilities absorb sunlight and convert it directly to electricity through the reaction of electrons in PV cells. Solar PV and other passive solar systems are relatively small and extremely reliable and have a number of other desirable characteristics. Building and electrical permits are required to install such systems, and PRMD has established a procedure and required documents for processing permits for solar photovoltaic systems.<sup>16</sup> In 2002, a solar PV system was installed on the roof of the Sonoma County Information Systems Department building. The PV system produces about 130,000 kilowatt-hours per year (kWh/y).

### **Waste-to-Energy**

Some waste materials can be used as a fuel in power plants to create electricity or other forms of energy. These power plants are defined by the type of fuel source they use: biomass, digester gas, industrial waste, landfill gas, and municipal solid waste.

Wood is a biomass source. In the more rural parts of the county that rely on propane as the primary heating fuel, individual homeowners often rely on wood burning stoves and fireplaces as a significant source of home heat. The EPA-certified wood stoves are cleaner burning, producing less air pollution. Refer to *Section 4.3 Air Quality* for discussion on the air quality issues related to wood burning.

---

<sup>13</sup> Nichols • Berman communication with Andy Parsons, Sonoma County Department of Emergency Services, May 2005.

<sup>14</sup> *2002 A Year of Accomplishment for Community and Climate Protection*, Sonoma County Climate Protection Campaign, press release, accessed online at [http://ci.santa-rosa.ca.us/City\\_Hall/City\\_Manager/CPC\\_121702-1.pdf](http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CPC_121702-1.pdf), December 19, 2002.

<sup>15</sup> *2002 A Year of Accomplishment for Community and Climate Protection*, Sonoma County Climate Protection Campaign, press release, accessed online at [http://ci.santa-rosa.ca.us/City\\_Hall/City\\_Manager/CPC\\_121702-1.pdf](http://ci.santa-rosa.ca.us/City_Hall/City_Manager/CPC_121702-1.pdf), December 19, 2002.

<sup>16</sup> Nichols • Berman communication with Cindy Rader, Sonoma County PRMD, May 2003.

The anaerobic digestion of municipal and household waste that occurs naturally in a landfill produces significant amounts of landfill gas that is composed of about 50 percent methane. Sonoma County has one landfill gas power plant- the Central Landfill Power Plant. Constructed in 1993, and expanded in 1996, the power plant at the County's Central Landfill generates 6,000 kW of electricity through the combustion of gas from the landfill. Garbage in the landfill decomposes through the activity of bacteria that release a gas that consists primarily of methane and carbon dioxide. The gas is collected through a series of wells hooked-up by pipelines that lead to a main pipeline that extends to a flare and the power plant, which consists of eight 800kW engine / generator sets. The electricity generated in the power plant is sent to transformers at the adjacent substation owned by the County, where it is converted to high voltage electricity and sold to PG&E. The County expanded the power plant to 7,500 kW in 2003 by adding two engine / generator sets. The County also plans to construct a landfill gas filtration system to remove contaminants and compress the remaining methane to become compressed natural gas (CNG), which would be used to fuel Sonoma County Transit buses.

### ***Wind Energy***

Wind power plants or farms are turbines which use the energy in the motion of the wind to make mechanical energy, which is then converted to electrical energy. In the year 2000, wind energy in California produced about 1.27 percent of the state's total electricity. Wind farms are generally located in areas with average annual wind speeds of at least 13 miles per hour. Sonoma County does not have any wind farms at this time.

Distributed wind systems, smaller wind turbines which provide on-site power in either a stand-alone or grid-connected configuration, are another application of wind energy. Distributed wind systems can be used by industry, water districts, rural residences, agriculture, and other isolated uses located in windy areas, such as along the coast. Small-scale wind systems are used to generate power for some residences, agricultural operations, and commercial uses, particularly in the rural areas of the County. The County has adopted an ordinance to permit small wind energy systems.

### ***Hydroelectric Energy***

Hydroelectric power is a significant source of California's electricity. In 1999, hydroelectric power plants produced about 15 percent of the total electricity generated in California. Hydroelectric energy is generated by hydraulic turbines that rotate due to the force of moving water as it flows from a higher to a lower elevation. The water can be flowing in natural streams and rivers or contained in manmade facilities such as reservoirs, pipelines, and canals.

The Sonoma County Water Agency operates a hydroelectric facility at Warm Springs Dam rated at 2.6 MW. The annual electricity production of the facility is about 13,000 MWh. The agency sells electricity from the facility to PG&E.

### ***Geothermal Energy***

Geothermal energy is produced by the heat contained below the earth's crust. This heat is brought to the surface as steam or hot water created when water flows through heated, permeable rock. Added together, California's geothermal power plants produce about five percent of California's total electricity.

Geothermal resources in Sonoma County consist of steam, hot water, and heat concentrated below the earth's surface. The Geysers Geothermal Power Plants (The Geysers) in northeast Sonoma County is the most developed of the high-temperature geothermal resource areas in California and the location of

the world's largest steam-dominated geothermal power plant. The Geysers consists of 12 power plants, ranging from about ten to 122 MW, totaling 1,122 MW, and owned and operated by Calpine Corporation.

The Geysers currently generates about seven percent of the total electricity that PG&E supplies to California. The Geysers Recharge Project, completed in 2003, will transport about 11 million gallons per day of reclaimed water through a pipeline from the Laguna Wastewater Treatment Plant of the Santa Rosa Subregional Reclamation System to the Geysers steam field for the generation of electricity. The project would provide enough reclaimed water to generate about 745,000 MWh/y of electricity, about a 15 percent increase in the current Geysers electricity generation rate of about five million MWh/y.

Hot water resources may exist in other areas of the County, including Dry Creek Valley, Alexander Valley, and Sonoma Valley. Hot water resources can be used for space heating, food drying, aquaculture, greenhouses, and other uses that require heat.

## **NON-RENEWABLE ENERGY SOURCES**

### ***Thermal Power Plants***

Thermal power plants convert fossil fuels (e.g., natural gas, petroleum, and coal) or nuclear fuels into electricity by burning the fuel (in most cases) to create heat which is then used to create steam, which in turn is used to turn a turbine that spins a generator that creates electricity. Natural gas and petroleum are also burned in gas turbine generators where the hot gases produced from combustion are used to turn the turbine. Sonoma County does not have any thermal power plants at this time.

### ***Fuel Cells***

Fuel cells operate much like a battery by transforming chemical energy into electrical energy directly without combustion. They require a continuous supply of hydrogen and oxygen, and produce direct current which must be passed through an inverter to create alternating current. Sonoma County does not have any public facilities that run on fuel cells. Information on the use of fuel cells by Sonoma County businesses is not available.

### ***Oil and Gas Facilities***

Sonoma County currently does not have any onshore or offshore fossil fuel (e.g., oil or gas) production facilities. A natural gas field with two wells between Sebastopol and Cotati was developed in the early 1980s and later shut down due to neighborhood complaints. The *Sonoma County Local Coastal Plan (LCP)*, amended as of December 2001, addresses Outer Continental Shelf (OCS) oil and gas development in the Coastal Zone. The *LCP* does not contain land use recommendations that encourage industrial or energy development in the coastal area.

The *Offshore Oil Development: Onshore Support Facilities Feasibility Study* was completed in January 1991. One of the primary findings of the study is that no suitable sites exist in the Coastal Zone for industrial onshore oil and gas support facilities.

### **PRIVATE ENERGY FACILITIES**

Small-scale solar photovoltaic (PV), hydroelectric, and wind systems are used to generate power for some residences, agricultural operations, and commercial uses in Sonoma County, reducing demand on the electricity grid. Solar electric installations provide a source of electricity for many private uses, and solar thermal installations provide electricity for active space and water heating at numerous businesses and residences throughout the county, particularly in rural areas. It is estimated that less than ten percent of the hydroelectric and about 50 percent of the wind systems are connected to the electricity grid.<sup>17</sup> Information on the number of small-scale, private power generation systems in the county is not available.

---

## **Energy – Regulatory Setting**

### **COUNTY REGULATIONS**

Sonoma County government's role in energy involves oversight of the County's own municipal energy expenditures and enforcement of the *Zoning Code*, which addresses the siting and operation of the types of energy facilities listed below. These facilities are permitted, permitted with a use permit, or not permitted in the various zoning districts:

- Facilities for the production or generation of electrical energy by a special district;
- Special district electrical substation facilities receiving less than one hundred thousand volts;
- Special district electrical transmission and distribution lines;
- Gas and electrical generation and transmission facilities, including necessary structures;
- Electrical substations receiving more than one hundred thousand volts;
- Transformer stations and small power stations;
- Development and use of natural resources with appurtenant structures;
- Exploration and development of geothermal resources;
- Exploration and development of low temperature geothermal resources for other than power development purposes;
- Geothermal energy wells, pipelines, and transmission facilities within the primary Known Geothermal Resource Area;
- Oil and gas wells;

---

<sup>17</sup> Nichols • Berman communication with Amy Lear, Sonoma County General Services Department, May 2003.

- Biomass energy projects; and
- Small wind energy systems.

The California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, regulates the exploration and development of oil and gas resources. Under the Sonoma County Zoning Ordinance, the exploration and development of oil and gas wells are permitted with a Use Permit in the Resources and Rural Development (RRD) and Resources and Rural Development (Agricultural Preserve; RRDWA) Zoning Districts.

The Local Coastal Plan recommends the following relative to Outer Continental Shelf oil and gas exploration or development:

*Require a Coastal Plan Amendment for any proposed onshore facility to support offshore oil and gas exploration or development. Any such amendment shall not be effective until a majority of the electors in Sonoma County, in a general or special election, approve the proposed amendment, unless such amendment is approved by the Commission pursuant to Section 30515 of the Coastal Act.*

The County has permitting authority over “decentralized generation” facilities, including small (i.e., less than 50 megawatt) thermal power plants, as well as non-thermal sources such as wind and solar energy. The County exerts regulatory control over the geothermal energy exploration, recovery, and power production at The Geysers.

## **STATE AND FEDERAL REGULATIONS**

### **Siting Energy Facilities**

The 1974 *Warren-Alquist Act* (Public Resources Code Section 25000 et seq.) created the State Energy Resources Conservation and Development Commission, more commonly known as the California Energy Commission (CEC). The CEC has five major areas of responsibility: forecasting future electricity and energy needs, licensing energy facilities to meet those needs, promoting energy efficiency, developing renewable energy sources and alternative energy generating technologies, and planning for and directing state response to energy emergencies.

In terms of electrical generating facilities, there are two project types that trigger preemption of local authority regardless of the project applicant. First, non-federal hydroelectric facilities (i.e., those not built by the federal government) are normally under the licensing authority of the Federal Energy Regulatory Commission (FERC). Exemptions from FERC’s license are granted only if a project meets specific criteria. Second, thermal power plants rated 50 megawatts (MW) or greater are normally under the authority of the CEC pursuant to the *Warren-Alquist Act*. Nuclear thermal power plants are under the authority of the U.S. Nuclear Regulatory Commission (NRC). A thermal power plant is any stationary or floating electrical generating facility using any source of thermal energy, such as oil, coal, natural gas, nuclear, and solar thermal power plants. It does not include wind, hydroelectric, or solar photovoltaic power plants. However, the statute which created the CEC’s jurisdiction also directs the CEC to consider whether a proposed project will conform to local laws, ordinances, regulations, and standards.

### ***Electricity Generation and Transmission- Deregulation***

A significant shift in the U.S. regulatory system began with the Energy Policy Act of 1992, which required interstate transmission line owners to allow all electrical generators to access their lines. Today many states are at various stages of electric utility deregulation.

Utility deregulation is one of the many reasons for the high level of interest in distributed energy resources (DER), small-scale power generation technologies (i.e., typically in the range of three to 10,000 kW) located close to where the electricity is used (e.g., a home, business, or government facility). The purpose is to provide an alternative to or an enhancement of the traditional electrical power system. Under the DER scenario, a variety of energy facilities and sources are used rather than relying on one energy technology. Related factors that have led to a growing national interest in on-site power generation include: inadequacy of the existing electrical power infrastructure to keep pace with soaring demand for high-quality, reliable power; reduced investment in large electrical generating plants; reduced incentives for utilities to invest in new generating facilities; and technological advancements in small-scale power generating equipment with greater efficiencies, environmental advantages, and lower costs. These facilities are referred to as *distributed generation* (DG).

The CEC's June 2002 *Distributed Generation Strategic Plan* emphasizes the role of local government in distributed generation:

- The role of local governments is critical to the future of DG in California. Permitting of DG is most likely to be performed by local governments. As such, local governments will need access to information that will assist them in making these permitting decisions.
- Local government facilities offer ideal settings for demonstrating DG technology, because public institutions can tolerate longer payback periods than private businesses, and their demonstration sites are visible to local residents and businesses.
- Local governments have land-use authority that can be used to express preferences toward local, small-scale electric generators for meeting their future energy needs.

---

### ***Energy – Significance Criteria***

This energy analysis uses criteria developed from the *State CEQA Guidelines, Appendix F*. According to these criteria, the project would have a significant energy resources impact if it would result in:

- Land use locations and patterns causing wasteful, inefficient, and unnecessary consumption of energy;
- The construction of new or retrofitted buildings that would have excessive energy requirements for daily operation; and
- Increased energy demand and the need for additional energy resources.

---

## Energy – Impacts and Mitigation Measures

### **Impact 4.12-1 Energy Consumption from Land Use Locations and Patterns**

*The Draft GP 2020 land use plan could affect energy usage by creating a land use pattern that could increase the dependence on single occupancy vehicles. The proposed land use pattern would be compact and focus future development within or adjacent to existing developed areas. Agricultural production and related uses would continue to be located in agricultural areas. This land use pattern would reduce the future reliance upon single occupancy vehicles, a major user of energy. As a result, this would be a less-than-significant impact. (LTS)*

Land use patterns can significantly affect energy consumption in either a positive or negative manner. For example, compact and multi-use development can greatly reduce transportation energy demands by allowing residential development in proximity to shop and work centers.

The land use patterns proposed in the *Draft GP 2020* would not be substantially different than those in the existing *General Plan*. While the historic land use pattern has resulted in scattered communities, the land use map would continue to focus most residential and commercial development within existing developed communities and limit future growth in rural areas except where needed to support agricultural production. By encouraging denser residential, commercial, and industrial development within urban areas the concentration of population, employment, and services allows for less frequent use of and reliance upon single-occupancy vehicles as a primary mode of transportation. Because automobile travel is a major user of energy, a reduction in reliance upon such travel would result in reduced levels of energy consumption.

While overall energy consumption would continue to increase as growth occurs, the *Draft GP 2020* would reduce the reliance upon single-occupancy vehicles by encouraging the establishment of alternative modes of transportation. For example, Policy **CT-4a** would implement commuter rail service between Cloverdale and Marin County by developing the Sonoma Marin Area Rail Transit (SMART) project. Policy **CT-1d** would call for cooperation with cities to provide jobs, housing, and shopping along the SMART corridor in order to reduce the need for automobile travel. Policies **CT-2a** through **CT-2aa** would increase the opportunities for use of transit systems, as well as other alternative modes to the single occupancy vehicle.

Goal **LU-2** would direct the County to accommodate the majority of future growth within the existing cities and their urban growth areas. Objective **LU-1.2** would encourage compact development by focusing the majority of commercial and industrial growth in the cities. Objective **LU-2.2** and **2.3** would direct most of the future population growth in unincorporated areas to occur in communities with adequate public services, thereby reducing energy demands for extended services. Objective **LU-2.5** would encourage higher density housing as well as the development of affordable housing units within Urban Service Areas and thereby support compact development patterns. Policies **LU-2a** through **LU-2d** would support Objectives **LU-2.2**, **2.3**, and **2.5** by managing residential holding capacity, continuously evaluating proposed projects in unincorporated areas for consistency with these goals, objectives, and policies, and providing for affordable housing opportunities in existing communities.

Goal **LU-3** and its supporting objectives and policies would further support compact city and community development. To reach this goal, these policies would rely on expansion area boundaries, cooperation with the Local Agency Formation Commission (LAFCO), limit service expansions outside of existing urban service areas, and maintain lower density areas outside of urban service boundaries.

Policy **OSRC-14c** would encourage County operations as well as residents and businesses to use alternative fuel vehicles.

The above goals, objectives, and policies would assure that implementation of the *Draft GP 2020* would not result in increased energy demands due to wasteful land use planning. This would be a less-than-significant impact.

**Mitigation Measure 4.12-1** None required.

**Impact 4.12-2 Energy Consumption from Building Construction and Retrofit**

*Land uses and development consistent with the Draft GP 2020 could result in inefficient and excessive use of energy resources. However, the Draft GP 2020 includes goals, objectives, and policies that would support energy efficiency in new construction and retrofit. As a result, this would be a less-than-significant impact. (LTS)*

Building design and retrofit measures can make a building more energy efficient. Because the design and retrofit of commercial and industrial buildings is different than that of residential buildings, there is a greater potential for energy savings in commercial and industrial facilities. This is particularly true due to the large amounts of energy that commercial and industrial facilities typically use for the manufacturing process, space heating and cooling, refrigeration, and lighting. Furthermore, because commercial and industrial buildings are typically much larger than residential structures, there are more opportunities for the reduction of energy demands.

Passive heating, cooling, and lighting techniques can be used to not only reduce energy demands, but also significantly reduce operating costs. Techniques include high levels of insulation, interior massing, careful placement of windows, skylights, and doors, natural ventilation, deliberate design of lighting, use of energy efficient appliances, windows, and doors, and appropriate landscaping. While new construction provides the simplest opportunity for implementation of such techniques, older buildings can also benefit from retrofitting for energy efficiency that includes passive heating, cooling, or lighting. New construction also provides the opportunity for optimal solar access through building siting and orientation, and thus further reduces energy demands for heating and cooling.

Existing codes as well as several objectives and policies in the *Draft GP 2020* would support energy efficiency in new and retrofit construction. Policies **OSRC-14b** and **OSRC-14c** would support energy efficiency in County operations and facilities by continuing the efforts underway in building retrofit and alternative fuel vehicle use. Policy **OSRC-14d** would reduce energy use in new construction by encouraging new projects to exceed the Energy Efficiency Standards of Title 24 of the California Building Code. Policy **OSRC-14e** would further reduce energy use in new construction by incorporating energy conservation and efficiency requirements into design guidelines for new development.

Although energy usage would continue to increase overall, these policies would reduce the level of energy consumption related to future building construction and retrofit. Therefore, this would be a less-than-significant impact.

**Mitigation Measure 4.12-2** None required.

**Impact 4.12-3 Increased Energy Demand and Need for Additional Energy Resources**

*Future land uses and transportation systems could substantially increase the demand for energy resources and the need for additional energy resources to meet this demand. This would be a significant impact. (S)*

Increased demand for energy is a byproduct of all future land uses and development consistent with the *Draft GP 2020*. As growth in the county increases, energy demand would also increase. Energy is consumed for heating and electricity in homes and businesses, for public infrastructure and service operations, and for agriculture, resource extraction, and rural uses. However, the primary user of energy resources is the motor vehicle.

Future growth in Sonoma County would be focused in the cities and unincorporated communities. Although effort is being made to increase modes of travel that would not be as dependent upon the automobile, energy consumption for vehicle travel will continue to rise.

This increased usage of energy will require additional sources of energy to supply the demand. These sources will likely continue to be the same sources that supply energy needs today. The Geysers Steamfield, energy production at the Central Landfill, and the Warm Springs Dam are local sources. Statewide energy demand will continue to be supplied by a combination of fossil fuels, hydroelectric, wind, cogeneration, and other sources. In the near future, the primary energy resource will continue to be oil and gas that is either produced domestically or imported from oil-producing countries worldwide.

The *Draft GP 2020* contains goals, objectives, and policies that address this increased demand in several ways. First, the Circulation and Transportation Element contains goals, objectives and policies (e.g., Goal **CT-2**, Policies **CT-2a** through **CT-2aa**, Goal **CT-4**, Policies **CT-4a** through **CT-4c**) which would contribute to reduction in fuel consumption by promoting and supporting opportunities for non-automobile travel and reduction in automobile use.

In addition, Goal **OSRC-15** and Objectives **OSRC-15.2** and **OSRC-15.5** would support the development of renewable energy sources and decentralized power generation. For example, the Geysers Geothermal Steamfield, augmented by re-used water from the regional wastewater system would be expected to continue to generate electricity. In addition, Policies **OSRC-15b** and **OSRC-15c** would promote the use of distributed energy systems, such as solar power and water heating or small wind energy systems, in County facilities and integrated into existing and new development. Policy **OSRC-15d** would add energy facility siting policies to the Sonoma County Integrated Development Code to allow for small-scale renewable energy generating systems could be sited close to energy users in all zoning districts. Policy **OSRC-15h** would also allow the use of hot water geothermal resources for energy generation in all land use districts.

Finally, the *Draft GP 2020* promotes energy education programs that would assist in reducing the demand for energy resources. Energy conservation and efficiency measures sometimes do not work simply because people either do not know about them or are not aware of their potential to save energy. As a result, education is a key tool in changing our behaviors and values relative to energy. Policy **OSRC-14a** would encourage energy conservation and efficiency through education. This policy would continue support for existing education programs that reduce waste, promote energy conservation, and encourage recycling programs for county residents, businesses, and County operations.

Sonoma County currently has a number of programs and projects that will continue to reduce future energy demand and increase efficiency. These are discussed in the environmental setting.

These policies and programs would contribute to reducing the increase in energy demand as well as promoting opportunities for increased production in ways that may be sustainable. However, because energy usage and demand would continue to increase as a consequence of future growth, however efficient, and because automobile travel would continue for some time to be the travel mode of choice, this would remain a significant impact.

**Mitigation Measure 4.12-3** No mitigation available beyond *Draft GP 2020* policies discussed in the impact analysis above.

**Significance After Mitigation** This would remain a significant unavoidable impact. (SU)