

## 5.6 ENERGY CONSERVATION

This section evaluates whether the proposed Fortuna General Plan 2030 (proposed plan) will result in the inefficient, wasteful or unnecessary consumption of energy. See Section 7.5 of this PEIR for an analysis of the electrical and natural gas infrastructure impacts of the proposed plan.

This section is based, in part, on the 2007 City of Fortuna Background Report, Section 7.6, Gas and Electric Service (Mintier & Associates, 2007). The Background Report is included as Appendix G of this PEIR.

### Environmental Setting

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#### Countywide Energy Use

The Humboldt County General Plan Energy Element Technical Report (e.g., Humboldt County, 2008) provides perhaps the most comprehensive assessment of energy use in the County, and by extrapolation, in Fortuna. The study reveals that mainstream average energy uses in the County are petroleum, natural gas, and electricity. Overall, energy use in the County is derived from:

- Gasoline/diesel: 49%
- Natural Gas: 28%
- Electricity: 18%
- Wood/biomass: 3%
- Propane: 2%

A large portion (73%) of the County's electricity is generated locally. Most of this electricity is generated in steam electric power plants that burn natural gas (PG&E's Humboldt Bay Power Plant) and biomass (Fairhaven Power Plant, smaller cogeneration plants). Electricity and natural gas, provided by PG&E, are used in the residential, commercial, industrial, and agricultural sectors. Lighting and refrigeration consume the majority of electricity in both the commercial and residential sectors. The greatest use of natural gas is for space heating and for the heating of water. The industrial sector uses electricity primarily in sawmills, with a small amount used for food and durable and non-durable goods production. Similarly, natural gas use in the industrial sector is almost entirely associated with sawmills, with the remainder used for food and non-durable goods production (Humboldt County, 2008).

#### Electricity

PG&E provides electric service within Humboldt County, including in the Planning Area. PG&E is a public utility regulated by the California Public Utilities Commission (CPUC). The PUC establishes rules for operation, customer rates, and PG&E's rate of return on investment. Electricity is provided through local generation (73 percent) and by transmission imports (27%; Humboldt County, 2008). The PG&E transmission system for Humboldt County consists of four transmission lines that supply less than half of the County's current peak electrical demand. Therefore, local generators (PG&E Humboldt Bay, Fairhaven, cogeneration plants) meet the majority of local electricity needs.

According to the Humboldt County Energy Element, there is currently enough local generation capacity to meet all of Humboldt County's electrical energy needs (Humboldt County, 2008). In 2001, during the California electricity crisis, Humboldt County was a net electricity exporter of 178,000 megawatt hours (MWh) (Ibid). In 2003, total electrical consumption for Humboldt County was 940,000 MWh (RCEA, 2004). Combining these existing County wide electricity consumption and surplus numbers, it is estimated that the current electricity supply in Humboldt County is 1,118,000 MWh.

The PG&E electricity distribution system serving Fortuna is largely in place, and PG&E is obligated under CPUC regulations to provide service to new customers within the City. New service requests, or requests for additional service, are generally governed by CPUC approved Rule 15 (Distribution Line Extensions) and Rule 16 (Service Extensions). Any new growth and development in the Planning Area could require the expansion of distribution and transmission lines and related facilities. Identification at this time of the potential future location and nature of future electricity infrastructure improvements would be highly speculative in contradiction of CEQA Guidelines §15146(b), and thus is not identified here. As new development is proposed in the future, system upgrades and improvements may be required in order to meet electricity demand, and those improvements would be subject to separate CEQA review.

Based on the Countywide annual per capita electricity demand estimate of 7.3 MWh (RCEA, 2004), the estimated existing annual electricity demand in the Planning Area is 82,862 MWh.

## **Natural Gas**

PG&E supplies natural gas within the County and Planning Area. PG&E operates and maintains a natural gas transmission pipeline that generally follows Highway 36 from Orland in the Sacramento Valley to a metering facility located in Alton. PG&E also operates and maintains smaller natural gas transmission facilities that extend north and south from Alton to serve the urbanized areas of Humboldt County, including the Planning Area (PG&E, 2005b).

Natural gas is conveyed to the Planning Area by pipes up to 12 inches in diameter (City of Fortuna, 1995). A 12-inch high pressure main and regulator station located on Fortuna Boulevard provide natural gas within the City is. There are also natural gas lines running under Newburg Road (Mintier & Associates, 2007).

Most households in the Planning Area are served by natural gas. Households and businesses located in areas without natural gas service use propane that is available from a variety of local providers.

Natural gas is generally available throughout Fortuna, and PG&E is obligated to provide service to new and existing customers. New service requests or requests for additional service are generally governed by Rule 15 (Gas Main Extensions) and Rule 16 (Gas Service Extensions).

Natural gas consumption in Humboldt County in 2003 is estimated at 93.9 million therms (RCEA, 2004). Based on this number and a County population of 132,755 persons (DOF, 2009), the existing annual per capita natural gas consumption (demand) is 707.3 therms. Based on this per capita estimate, the estimated existing annual natural gas demand in the Planning Area is 8.0 million therms.

## Gasoline

Because of its rural nature, Humboldt County residents have a higher vehicle miles traveled (VMT) than do more densely populated regions. This is due both to a greater number of personal VMT, as well as to the need to transport the majority of consumer goods into and other materials (lumber, municipal refuse, etc.) out of the county. Per to the 2000 US Census, 72% of workers in the county drive to work alone, 13% carpool, 7% walk, 1% use public transit, and 6% work at home.

The City of Fortuna is a small rural incorporated city of 11,351 persons (DOF, 2009). Timberland, farmland and open space dominate the region. The City of Rio Dell is located approximately five miles to the south, the City of Ferndale lies approximately seven miles to the west, and the City of Eureka, the main population and employment center in Humboldt County, is approximately 18 miles to the northwest. Several small unincorporated communities are in the area, including Hydesville, Scotia, Carlotta and Loleta.

Fortuna is located east of U.S. HWY 101 and north of State Route (SR) 36. HWY 101 is the major north-south highway serving Humboldt County. SR 36 passes across Humboldt and Trinity Counties, connecting HWY 101 to SR 3 at Douglas City, and then continuing east to Interstate 5 in Tehama County.

Approximately 51% of Fortuna's population is of working age and there is an estimated employment base of approximately 3,342 jobs (see Table 3.1-2 in Section 3.1 of this PEIR). However, only about 57% of the City's working age population works in the City of Fortuna; the balance work in Eureka, Rio Dell, Ferndale, Arcata and in surrounding unincorporated areas. Therefore, per-capita motor vehicle use, trip length, and resulting VMT are higher for Fortuna residents than if a greater proportion of the City's working age population worked within the city limits.

## Energy Conservation Basics

Energy efficiency means using the least energy possible to perform a particular function. Installing light bulbs that maintain illumination levels with less electricity, installing additional insulation, and switching to a vehicle with high gas mileage are examples of energy efficiency measures. 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 air conditioners, and making fewer vehicle trips are examples of energy conservation measures.

Relative to renewable forms of energy, fossil fuel-derived energy (including electricity generated by the burning of natural gas) has greater environmental impacts related to extraction, processing, transportation, transmission and use. These impacts include localized environmental degradation and broader-scale (transboundary) impacts such as air pollution, groundwater contamination, and greenhouse-gas emissions.

From an urban planning perspective, there are generally three categories of energy efficiency and conservation measures that can be implemented to reduce energy consumption.

- **Land Use Measures:** Planning for and developing more compact and mixed-use development, encouraging infill development, and providing housing near employment centers, can minimize motor vehicle use and reduce VMT;
- **Transportation Measures:** Providing transit and non-vehicular connectivity, and providing bus stops, pedestrian trails, and bicycle lanes in new development can decrease reliance on motor vehicles; and
- **Energy Conservation Measures:** Providing energy efficient construction/retrofitting, equipping buildings with the latest energy conserving features, orienting structures to maximize solar heating, and educating the community on energy conservation can lead to the efficient use of energy in construction.

According to Humboldt County's Draft General Plan Energy Element, implementing energy efficiency/conservation measures such as those listed above can reduce electricity and natural gas consumption by approximately 8% and 5%, respectively, and through reduced VMT, gasoline consumption by approximately 5% (Humboldt County, 2008).

## Applicable Plans, Policies, Codes and Regulations

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### State

**California Environmental Quality Act (CEQA).** CEQA requires that EIRs discuss the potential energy impacts of proposed projects, including whether a proposed project would result in the inefficient, wasteful or unnecessary consumption of energy.

**California Energy Efficiency Standards.** The California Energy Efficiency Standards (CCR, Title 24, Part 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption in residential and non-residential development. The standards set energy conserving design and feature requirements for new conditioned-space buildings, including requirements for insulation levels and air duct tightness of fit, square footage limitations for windows, doors and skylights, and efficiency requirements for lighting, water heating systems, and space heating and cooling systems.

### Local

**Redwood Coast Energy Authority's Comprehensive Action Plan for Energy.** The RCEA was formed as a joint powers authority representing Humboldt County and the cities of Fortuna, Eureka, Arcata, Blue Lake, Ferndale, Trinidad and Rio Dell. RCEA's mission is to develop and implement sustainable energy initiatives that reduce energy demand, increase energy efficiency, and advance the use of clean, efficient, and renewable resources available in the region (Humboldt County, 2008). As the regional energy authority, the Humboldt County Board of Supervisors has designated RCEA to implement strategies on a regional basis through a Comprehensive Action Plan for Energy. This action plan, once developed, will be implemented by the County and seven cities via their General Plans (Humboldt County, 2008).

**Fortuna Municipal Code.** Title 15 of the Fortuna Municipal Code (Building and Construction) adopts the State's Energy Efficiency Standards (CCR, Title 24, Part 6).

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## Methodology

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### Policy Background

The following policy background is used to assess the energy conservation impacts of the proposed plan:

- Electricity and natural gas will continue to be provided to Fortuna by PG&E, and PG&E is obligated under CPUC regulations to provide service to new customers within the City;
- The PG&E electric and natural gas distribution systems serving Fortuna are largely in place, and any capacity improvements required to serve Fortuna in the future will be undertaken by PG&E as required by CPUC regulations; and
- Development under the proposed plan will lead to increased demand for energy that can be met with more energy by PG&E, the implementation of energy efficiency/conservation measures, and/or the generation of electricity from renewable forms of energy.

### Thresholds of Significance

Proposed General Plan implementation will have a significant energy conservation impact if it results in the inefficient, wasteful or unnecessary consumption of energy.

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## Implications of the Draft Land Use Diagram

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Under buildout of the proposed plan, the population within the Planning Area will increase from 11,351 (DOF, 2009) to 24,904 persons. Based on the per capita electricity and natural gas consumption rates discussed previously, this additional population will increase annual electricity demand within the Planning Area from 82,862 to 181,799 MWh (a 119% increase), and will increase annual natural gas demand within the Planning Area from 8.0 to 17.6 million therms (a 120% increase).

Under the proposed plan, motor vehicle trips and thus VMT and gasoline consumption will also increase. According to the traffic analysis contained in Section 4.1 of this PEIR, motor vehicle trips under the proposed plan will increase from 77,505 to 156,507 trips per day (a 102% increase). Based on this increase, an assumed trip length of eight miles which is twice the national average<sup>1</sup> (U.S. Dept. of Transportation, 2006), and an assumed average mpg of 20 (U.S. Dept. of Transportation, 2005), annual gasoline consumption under the proposed plan would increase from approximately 11.3 to approximately 22.8 million gallons.

The increase in electricity, natural gas, and gasoline consumption under the proposed plan is summarized in Table 5.6-1.

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<sup>1</sup> Twice the national trip length average is assumed here because, as discussed earlier, more than half of City of Fortuna's residents work outside the City.

**Table 5.6-1  
Energy Consumption Under the Proposed Plan**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Annual Energy Consumption |                                 |                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------|-------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Electricity<br>(MWh)      | Natural Gas<br>(million therms) | Gasoline<br>(gallons)   |
| Existing Conditions <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 82,862 <sup>3</sup>       | 8.0 <sup>4</sup>                | 11,315,730 <sup>5</sup> |
| Plan Buildout <sup>2</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 181,799 <sup>3</sup>      | 17.6 <sup>4</sup>               | 22,849,730 <sup>5</sup> |
| <i>Assumptions:</i><br><sup>1</sup> Planning Area 2009 population size of 11,351.<br><sup>2</sup> Planning Area buildout population size of 24,904.<br><sup>3</sup> Based on Countywide 2003 average per capita electricity demand estimate of 7.3 Megawatt Hours (MWH) (RCEA, 2004).<br><sup>4</sup> Based on Countywide 2003 average per capita natural gas consumption of 707.3 therms (RCEA, 2004).<br><sup>5</sup> Based on 77,505 existing trips per day and 156,707 trips per day (SHN, 2010), an average trip length of 8 miles which is twice the national average (U.S. Dept. of Transportation, 2006), and an average mpg of 20 (U.S. Dept. of Transportation, 2005).<br>Source: Planwest Partners, July 2010. |                           |                                 |                         |

## General Plan Policy Response

The proposed General Plan includes the following policies and programs relevant to energy conservation.

### Land Use

**Policy LU-1.5 Land Use Balance.** The City shall promote the development of a healthy balance of residential, commercial, open space, institutional, and industrial businesses within the city.

**Policy LU-1.6 Infill Development.** The City shall encourage infill development on vacant sites and reuse of underutilized parcels to minimize outward growth.

**Policy LU-1.11 Leapfrog Development.** The City shall discourage leapfrog development and development in peninsulas extending into agricultural and open space lands.

**Policy LU-1.13 Annexations.** The City shall encourage future urban development within the Planning Area to occur under the City jurisdiction. To this end, the City shall require that vacant unincorporated properties be annexed to City prior to providing City services.

**Policy LU-2.3 Infill/Replacement Housing.** The City shall collaborate with its Redevelopment Agency to promote CBD housing opportunities through infill projects and replacement housing.

**Policy LU-4.3 Multi-Family Housing.** The City shall encourage multi-family housing to be located throughout the community, but especially within or near major transportation corridors, Downtown, major commercial areas, neighborhood commercial, and employment centers.

**Policy LU-4.4 Residential Amenities.** The City shall encourage residential projects to be designed with pedestrian paths that connect to schools, commercial, and public transportation.

**Policy LU-6.2 Reinforce Vitality of Existing Commercial Centers.** The City shall discourage isolated/sprawling commercial development and instead reinforce existing commercial centers.

**Policy CD-1.8 Transit/Pedestrian-Oriented Design.** The City shall encourage project design that increases convenience, safety, and comfort for people using transit, walking, and cycling.

**Policy CD-1.9 Pedestrian Circulation.** The City shall require that new commercial development design to facilitate pedestrian circulation between commercial and residential areas.

## Transportation

**Policy TC-3.2 Fixed-Route Transit.** The City shall work with HCAOG, the Humboldt Transit Authority (HTA), and Redwood Transit Service (RTS) to expand transit service to serve new development, including direct connections to employment, residential, and commercial areas.

**Policy TC-3.4. Alternative Transportation Linkages.** The City shall link pedestrian and bike routes with public transportation to further facilitate their use.

**Policy TC-4.2 New Developments.** The City shall continue to require new development to finance and install sidewalks and pedestrian pathways connecting them to existing sidewalks.

**Policy TC-4.3 Specific Plans.** The City shall encourage developments to include pedestrian access that enables residents to walk to places of work, recreation and shopping.

**Policy TC-4.4 Regional Pedestrian Needs Assessment Update.** The City shall implement the projects identified in the HCAOG Regional Pedestrian Needs Assessment Study.

**Policy TC-5.1 Fortuna Bike Plan.** The City shall strive to fully implement Fortuna's Bike Plan to fill in gaps in the existing bicycle network and link residential and commercial areas.

**Program HS-5.** The City shall require large development projects to: (1) provide sidewalks, and pedestrian-enhancing features; (2) work with RTS to extend transit service; and (3) for commercial, office and mixed-use projects, initiate a voluntary ridesharing program for workers, provide preferential parking for ridesharing vehicles, and provide workers with transit incentives.

## Energy Conservation

**Policy NCR-6.1 Site Design Standards.** The City shall strive to incorporate energy-efficient construction techniques and materials.

**Policy NCR-6.2 New Development Requirements.** The City shall encourage new development to pre-wire for solar/wind and plumbed for hot water panel installation.

**Policy NCR-6.5 Solar Access.** The City shall encourage solar access in site planning.

**Policy NCR-6.7 Energy Star Equipment.** The City shall purchase/operate Energy Star electrical equipment and promote Energy Star equipment in the community.

**Policy NCR-6.8 Energy Audits.** The City shall coordinate with the RCEA to encourage property owners to conduct energy audits.

**Policy NCR-6.9 Retrofitting for Energy Efficiency.** The City shall promote retrofitting of existing energy-inefficient buildings to meet or exceed energy efficiency standards.

**Policy NCR-6.13 Public Information and Education.** Continue to provide information, marketing, training, and education to support energy efficiency and energy conservation.

**Policy NCR-6.14 Explore Energy Efficiency Standards for Existing Buildings.** Explore and, if appropriate, adopt energy efficiency standards for existing buildings upon remodel.

**Program NCR-26.** The City shall review its codes and ordinances to identify revisions that could promote and provide incentives for energy efficient building design/construction.

**Program HS-5.** The City shall require large development projects to increase energy efficiency in proposed buildings by 20% beyond Title 24 requirements

## Impacts and Mitigation

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### Impact 5.6-1: Inefficient, Wasteful or Unnecessary Consumption of Energy

*Proposed General Plan implementation will not result in the inefficient, wasteful or unnecessary consumption of energy.*

#### Discussion

Buildout under the proposed Land Use Diagram will increase the resident population of the Planning Area from 11,351 to 24,904 persons. This will increase the Planning Area's annual electricity consumption from 82,862 to 181,799 MWh (a 119% increase), annual natural gas consumption from 8.0 to 17.6 million therms (a 120% increase), and annual gasoline consumption from 11.3 to 22.8 million gallons (a 101% increase). The proposed plan could also result in small increases in the consumption of propane and/or energy from wood/biomass.

As described previously, there are generally three categories of energy efficiency/conservation measures that can be implemented under urban planning projects to reduce energy consumption. The analysis below demonstrates that the proposed plan will implement each of these.

Land Use Measures: The proposed Plan includes a proposed Land Use Diagram that maps future planned land uses in the City and its SOI by land use designation, and defines the types and densities of land uses permitted under each of these designations in Chapter 1 of the proposed Policy Document. As indicated, the proposed plan will: (1) set a land use pattern whereby the greatest density and intensity of development will occur in Fortuna's

urban core, gradually lessening in density and intensity towards the periphery; and (2) establish mixed-use land use designations, such as Mill District (MD), Corridor Mixed Use (CMU), and Riverwalk District (RD), where vertical mixed-use commercial, office and residential uses can be development together. These two land use features will provide for an efficient land use pattern that reduces motor vehicle trips, reduces VMT, and maximizes transit use, thereby reducing gasoline consumption.

In addition to the above, the proposed plan includes policies designed to provide a balance of residential and employment-generating uses, provide compact and mixed-use development, encourage infill, discourage leapfrog development, and provide housing near employment centers:

- Policy LU-1.5 requires the City to promote a balance of land use in the City;
- Policies LU-1.6, -1.11 and -2.3 require the City to encourage infill and discourage leapfrog development;
- LU-1.13 requires that unincorporated properties be annexed to the City prior to receiving City services;
- Policy LU-4.3 require the City to encourage higher density housing near major transportation corridors, Downtown, and commercial and employment centers;
- Policy LU-6.2 requires the City to discourage isolated/sprawling commercial development and instead reinforce existing commercial centers;
- Policies LU-4.4 and CD-1.8 require new residential projects be developed with pedestrian and bike paths to connect residential neighborhoods with schools, commercial and employment centers and public transportation, and work with transit providers to extend service to new projects;
- Policy CD-1.9 requires developers of new commercial projects to incorporate pedestrian access routes between their projects and adjacent residential areas.

These policies will function to reduce motor vehicle use, VMT, and gasoline consumption

Transportation Measures: The proposed plan includes policies and programs designed to extend transit to new development, provide trails and bicycle paths in new development, and provide transit and non-vehicular connectivity.

- Policies TC-3.2 and – 4.4 require the City to work with HCAOG, HTA and RTS to extend transit service to new development and to implement the projects identified in HCAOG’s Regional Pedestrian needs Assessment Study;
- Policy TC-3.4 requires the City to link pedestrian and bike routes with public transportation to facilitate their use;
- Policies TC-4.2 and -4.3 require new development to install sidewalks and pedestrian paths which connect to existing sidewalks and to work, recreation and shopping;
- Policy TC-5.1 calls for the City to fully implement Fortuna’s Bike Plan and fill in gaps in the existing bicycle network;

- Program HS-5 requires commercial, office and mixed-use projects to initiate voluntary ridesharing programs for workers, provide preferential parking for ridesharing vehicles, and provide workers with incentives to use mass transit.

These policies and programs will function to maximize transit used and reduce per capita motor vehicle use, VMT, and gasoline consumption.

Energy Conservation Measures: The proposed plan includes policies and programs designed to ensure energy efficient construction, that new development is equipped with energy conserving features, and that the public is properly informed as to energy conserving conservation.

- Policy NCR-6.1 calls for the City to incorporate energy-efficient construction techniques and materials in City owned buildings;
- Policy NCR-6.2 encourages new development to pre-wire for solar/wind and to be plumbed for hot water panel installation;
- Policy NCR-6.5 encourages solar access in site planning;
- Policy NCR-6.7 requires the City to use Energy Star appliances in City buildings and promote their use in the greater community;
- Policy NCR-6.8 requires the City to encourage property owners to conduct energy audits;
- Policy NCR-6.9 requires the City to promote the retrofitting of existing energy-inefficient buildings to meet or exceed modern energy efficiency standards;
- Policy NCR-6.13 requires the City to continue to provide information, training and education to the community on energy efficiency and conservation;
- Program NCR-26 requires the City to review its codes and ordinances to identify the opportunity for revisions that would promote and provide incentives for energy efficient building design/construction.

These policies and programs will function to reduce electricity and natural gas consumption associated with the lighting, heating and cooling of structures, and will encourage the eventual transition to renewable forms of energy such as solar and wind.

According to Humboldt County's Draft Energy Element, implementation of energy efficiency/conservation measures can reduce electricity and natural gas consumption by approximately 8% and 5%, respectively, and gasoline consumption by approximately 5% (Humboldt County, 2008). Therefore, implementation of the proposed policies and programs will, at projected buildout in 2030, reduce annual energy consumption to an estimated 167,255 MWh of electricity, 16.7 therms of natural gas, and 2.2 million gallons of gasoline.

Based on this analysis, the proposed plan will not result in the inefficient, wasteful or unnecessary consumption of energy, and a less than significant impact will occur.

### **Determination of Level of Significance**

Less-Than-Significant

### **Mitigation**

No mitigation required

### **References Cited**

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