

4.12 ENERGY AND MINERAL RESOURCES

This section was prepared pursuant to CEQA Guidelines Section 15126) and Appendix F of the CEQA Guidelines, which require that EIRs include a discussion of the potential energy impacts of projects, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. This information in this section is based largely on data and reports produced by the California Energy Commission and the Energy Information Administration of the U.S. Department of Energy. The specific sources and citations are listed in Section 10, References.

4.12.1 Introduction

Energy consumption is analyzed in an EIR because of the environmental impacts associated with its production and usage. Such impacts include the depletion of nonrenewable resources (e.g., oil, natural gas, coal, etc.) and emissions of pollutants during both the production and consumption phases.

Energy usage is typically quantified using the British Thermal Unit (Btu). As points of reference, the approximate amount of energy contained in a gallon of gasoline, a cubic foot of natural gas, and a kilowatt hour (kWhr) of electricity are 123,000 Btu's, 1,000 Btu's, and 3,400 Btu's, respectively.

Energy conservation is embodied in many federal, state, and local statutes and policies. At the federal level, energy standards apply to numerous products (e.g., the EnergyStar™ program) and transportation (e.g., fuel efficiency standards). At the state level, Title 24 of the California Administrative Code sets forth energy standards for buildings, rebates/tax credits are provided for installation of renewable energy systems, and the Flex Your Power program promotes conservation in multiple areas.

Various policies in the City's General Plan have been adopted to assist the City in avoiding or mitigating energy impacts resulting from urban development projects. All future development addressed by this EIR will be subject to the energy policies listed in Chapter 4, Goals and Policies, of the City's General Plan, including the following:

- *Energy Policy #2*: The amount of energy used for commuting should be reduced.
- *Energy Policy #3*: Public facilities should be located in areas easily served by public transportation.
- *Energy Policy #4*: New development should be energy efficient.
- *Energy Policy #6*: All street lights outside of the Downtown area should use low-pressure sodium vapor.
- *Green Building Policy #1 and #2*: Green building policy goals and the LEED Green Building Rating System shall be adopted for all City facilities.
- *Green Building Policy #3*: The City shall provide leadership and guidance to encourage the application of green building practices in private sector development.

4.12.1.1 *Sustainable City Strategy*

The Sustainable City Major Strategy is a statement of San José's desire to become an environmentally and economically sustainable city. The Strategy seeks to reduce traffic congestion, pollution, wastefulness, and environmental degradation of our living environment by conserving natural resources and preserving San José's natural living environment.

4.12.1.2 *Green Building Policy*

The Green Building Policy fosters long-term social, economic, and environmental sustainability in building and development while making green building the standard practice in San José and celebrating sustainability as a core value to the community. The vision for Green Building in San José is a place where the people have the knowledge and opportunities to build and occupy dwellings that have a maximum impact on the well being of the occupants and a minimal impact on the environment. The Green Building Policy goals center on five main categories: sustainable sites, energy and atmosphere, water efficiency, materials and resources, and indoor environmental quality.

4.12.1.3 *Energy Goal*

The City's Energy Goal is to foster development which, by its location and design, reduces the use of non-renewable energy resources in transportation, buildings and urban services (utilities) and expands the use of renewable energy resources.

4.12.2 Existing Setting

Total energy usage in California was 8,130 trillion Btu's in the year 2003 (the most recent year for which this specific data is available).⁴⁷ Of California's total energy usage in 2003, the consumption breakdown by sector was 1,469 trillion btu for residential uses, 1,484 trillion btu for commercial uses, 1,903 trillion btu for industrial uses, and 3,275 trillion btu for transportation.

Given the nature of the proposed project (i.e., a land use decision in San José), the remainder of this discussion will focus on the three most relevant sources of energy: electricity, natural gas, and gasoline for vehicle trips associated with residential, workplace, and commercial uses.

Electricity

In 2003, California used over 276,000 gigawatt hours of electricity. This electricity was produced from power plants fueled by natural gas (37%), coal (21%), hydro (16%), nuclear (15%), and renewables (11%). Approximately 78% of the electricity was generated within California, with the balance imported from other states, Canada, and Mexico.

Electricity usage in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building. That said, the average annual usage of electricity is roughly 6,500 kWhr/residence. The average annual usage of electricity is roughly 13 kWhr/square foot for all commercial buildings and roughly 18 kWhr/square foot for office/R&D buildings.

Electricity supply in California involves a complex grid of power plants and transmission lines located in the Western United States, Canada, and Mexico. The issue is complicated by market forces that have become prominent since 1998, which is when a new regulatory environment commonly referred to as "deregulation" took effect in California. Supply is further complicated by the fact that the peak demand for electricity is significantly higher than the off-peak demand. For example, in August 2004, peak electric demand - due in large part to hot weather - reached a record high of 44,497 megawatts, which is almost double the lowest demand period.

⁴⁷ U.S. Dept. of Energy's Energy Information Administration.

In 2000-2001, electric demand exceeded supply on various occasions, which required utilities to institute systematic rotating outages to maintain the stability of the grid and to prevent widespread blackouts. Since that time, additional generating capacity has come on-line and upgrades to various transmission lines are occurring.

According to the California Energy Commission's 2003 Integrated Energy Policy Report, the current outlook is that California will have an adequate supply of electricity through 2009.

Natural Gas

In 2001, California used almost 2.4 trillion cubic feet of natural gas. The natural gas was used to produce electricity (41%), in industrial uses (28%), in commercial uses (10%), and in residential uses (21%). Approximately 16% of the natural gas was produced within California, with the balance imported from other states and Canada.

Natural gas usage in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all gas-consuming devices within a building. That said, the average annual usage of natural gas is roughly 45,000 cubic feet/residence. The average annual usage of natural gas is roughly 37 cubic feet/square foot for commercial buildings and roughly 29 cubic feet/square foot for office buildings.

According to the California Energy Commission's 2003 Integrated Energy Policy Report, the current outlook is that Northern California will have an adequate supply of natural gas through 2007. However, the report notes meeting peak demand under extreme weather conditions may require gas infrastructure improvements (e.g., additional pipeline capacity) earlier than currently programmed.

Gasoline for Motor Vehicles

Californians presently consume roughly 49.5 million gallons of gasoline and diesel each day. This is a 53% increase over the amount that was used 20 years ago. The primary factors contributing to this increase are: 1) population growth; 2) declining per-mile cost of gasoline; 3) land use patterns that have increased the distance between jobs and housing; and 4) a shift in consumer preferences to larger, less fuel efficient motor vehicles.

The average fuel economy for the fleet of light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from about 12.6 miles-per-gallon (mpg) in the mid-1970s to the current 20.7 mpg. However, no further improvements in the average fuel economy for the overall fleet are projected through the year 2020. This conclusion is based on the fact that projected increases in the number of fuel efficient cars (e.g., hybrids) will be offset by projected increases in the number of SUVs, pickups, and vans.

Although no new refineries have been constructed in California since 1969, supply has kept pace with demand through a combination of refinery upgrades/modernizations and out-of-state imports.

According to the California Energy Commission's 2003 Integrated Energy Policy Report, the demand for gasoline and diesel for on-road vehicles is projected to increase by 36% over the next 20 years. Imports of foreign crude oil will increase as in-state and Alaskan supplies diminish. Since California refineries are already operating close to their full capacity, daily imports of refined gasoline and diesel are expected to double over the next 20 years. Unless out-of-state facilities expand, the gasoline and diesel markets will become increasingly volatile, with the likelihood of shortages and more prolonged periods of high prices.

Mineral Resources

The CVSP Area is primarily undeveloped. Although some quarrying activities were conducted near Coyote Creek, it does not contain any known or designated mineral resources.

4.12.3 Energy and Mineral Resources Impacts

4.12.3.1 *Thresholds of Significance*

For the purposes of this EIR, an energy impact would be significant if the project will:

- use fuel or energy in a wasteful manner; or
- result in a substantial increase in demand upon energy resources in relation to projected supplies; or
- result in longer overall distances between jobs and housing; or
- result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

4.12.3.2 *Energy Impacts of the Proposed CVSP*

Under the CVSP, new land uses and infrastructure would be constructed, including approximately 26,400 dwelling units, 55,000 jobs and associated public services, roadways, flood control and storm drainage facilities, and utilities. Energy will be consumed during both the construction and operational phases of development. The construction phase will require energy for the manufacture and transportation of building materials, preparation of the various sites (e.g., grading), and the actual construction of the buildings and infrastructure. The operational phase will consume energy for multiple purposes including, but not limited to, building heating and cooling, lighting, appliances, electronics, office equipment, and commercial machinery. Operational energy will also be consumed during each vehicle trip associated with these proposed uses.

Rough estimates of operational energy usage by the proposed CVSP development are provided in Table 4.12-1. The data in Table 4.12-1, which utilize average energy consumption factors, are based on the land uses that would be constructed under the proposed CVSP. It is important to note that actual energy usage could vary substantially depending upon factors such as the type of industrial and commercial uses that would occupy the buildings, actual miles driven by future residents/employees, and the degree to which energy conservation measures are incorporated into the various facilities. As previously described, PG&E has projected that planned development of the Coyote Valley may require construction of an additional electric distribution substation to provide adequate power.

in more distant locales (e.g., Monterey County, San Benito County, San Joaquin County, etc.). Increasing the supply of housing locally would presumably reduce the magnitude of this phenomenon, based on the assumption that short commute distances are generally preferable to longer commute distances. In addition, the majority of jobs are located in the northern portions of the County; therefore, the provision of jobs within southern Santa Clara could help to reduce the effects of the reverse commute, further reducing miles traveled and energy consumed.

The project is projected to add approximately 303,000 new person trips per day, of which approximately 85 percent are expected to be vehicle trips rather than trips that use alternative transportation modes, such as Caltrain and the proposed in-valley transit system.

Impact EMR-2: Development proposed by this project would result in a significant increase in gasoline use. **[Significant Impact]**

4.12.3.3 *Impacts to Mineral Resources*

According to the City of San José 2020 General Plan, there are no mineral deposits outside of the Communications Hill Area which are of statewide significance. The CVSP Area is not located in an area known to contain mineral deposits of statewide or regional significance.

Impact EMR-3: The CVSP Area does not contain mineral deposits of statewide or regional significance. **[No Impact]**

4.12.4 Mitigation and Avoidance Measures for Energy Impacts

4.12.4.1 *Mitigation for Impacts Associated with Electricity and Natural Gas*

Final design of the proposed project will incorporate many of the energy policies of the San José 2020 General Plan and the City's Green Building Policy to reduce energy impacts related to electricity and natural gas. In addition, other mitigation measures shall be considered as technology develops. If it is determined by the City Council that these measures are feasible and requires them as conditions of approval, they would reduce significant impacts to a less than significant level. These measures shall be implemented at the permitting stage to the satisfaction of the Director of Planning, Building, and Code Enforcement, the Director of the Environmental Services Department, and/or the Manager of the City's Construction & Demolition Recycling Program. In the event the mitigation is determined to be infeasible, the impact would be significant and unavoidable and adoption of a statement of overriding considerations will be required.

MM EMR-1.1: The project shall incorporate principles of passive solar design. Passive solar design is the technology of heating, cooling, and lighting a building naturally with sunlight rather than with mechanical systems because the building itself is the system. Basic design principles are large south-facing windows with proper overhangs, as well as tile, brick, or other thermal mass material used in flooring or walls to store the sun's heat during the day and release it back into the building at night or when the temperature drops. Passive solar also takes advantage of energy efficient materials, improved insulation, airtight construction, natural landscaping, and proper building orientation to take advantage of the sun, shade, and wind.

MM EMR-1.2: The project shall install reflective, *EnergyStar*[™] cool roofs. Cool roofs decrease roofing maintenance and replacement costs, improve building

comfort, reduce impact on surrounding air temperatures, reduce peak electricity demand, and reduce waste stream of roofing debris.

- MM EMR-1.3:** The project shall utilize local and regional building materials in order to reduce energy consumption associated with transporting materials over long distances. Of the building materials used, 20-50% shall have been manufactured within 500 miles of the building site.
- MM EMR-1.4:** The project shall utilize building products that contain post-consumer recycled materials to reduce the use of raw materials and divert material from landfills. Construction material uses shall be at least 5-10% salvaged or refurbished materials. Specifically, a minimum of 25-50% of building materials shall contain at least 20% post-consumer recycled content material, or a minimum of 40% post-industrial recycled content material.
- MM EMR-1.5:** All residences shall be constructed to meet the requirements of the *EnergyStar*TM program for new homes. Such residences improve energy efficiency by a minimum of 15 percent as compared to residences that simply meet the Title 24 requirements. The additional efficiency is typically accomplished through the use of tight construction, energy-saving windows, improved insulation, and super-efficient heating/cooling systems.
- MM EMR-1.6:** Although there is not a formal *EnergyStar* program for non-residential buildings, all buildings to be constructed by the project could be constructed to meet the same standards as those that apply to the residential program.
- MM EMR-1.7:** All new buildings shall include a photovoltaic (i.e., solar electric) system on rooftops. An average-sized residential system (2.5 kW) in California produces in excess of 4,000 kWhr annually, which equates to 62% of the average electricity demand per residential unit. Commercial systems are generally larger than residential systems and produce commensurately more electricity. [Note: The rule of thumb is that each square foot of photovoltaic cells produces 10 watts of power in bright sunlight.]⁴⁸
- MM EMR-1.8:** Geothermal heat pumps shall be installed to provide heating, cooling, and hot water. Geothermal heat pumps are generally more efficient and less expensive to operate and maintain than conventional systems.
- MM EMR-1.9:** The project shall incorporate the use of the following in all development, to the extent feasible:
- Installation of motion detectors or dimmers to control lighting;
 - Installation of efficient security, street, and parking lot lighting (e.g., high pressure low sodium fixtures);
 - Installation of reflective window film or awnings on south and west facing windows;
 - Installation of ceiling and wall insulation;

⁴⁸The cost for photovoltaic systems has been decreasing in recent years, and the State of California provides rebates and tax credits to builders for such systems. In addition, some builders are incorporating such systems into the design of their new homes.

- Installation of Energy Management Systems to control HVAC systems including operating hours, set points, scheduling of chillers, etc.

4.12.4.2 *Mitigation for Impacts Associated with Transportation Energy*

The construction of an employment center in the southern portion of the Santa Clara County would reduce the lengths of regional commute trips. In addition, the construction of housing in proximity to future jobs would reduce local vehicle miles traveled. Although overall trip lengths may be shorter as a result of the project, the CVSP project would still result in a substantial increase in the use of gasoline. The above-described impact regarding increased use of gasoline associated with commute trips cannot be mitigated by the project, as proposed. Therefore, the impact would be significant and unavoidable and the adoption of a statement of overriding considerations will be required.

4.12.5 Conclusions Regarding Energy and Mineral Resources Impacts

Impact EMR-1: Given projections regarding future electricity and natural gas demands and supplies, construction of the CVSP will result in a significant energy impact. Implementation of the mitigation measures described above (MM ENG-1.1 through 1.8) would reduce this impact to a less than significant level, if they are found to be feasible and are made a condition of approval. If they are found to be infeasible, a statement of overriding considerations would be required. **[Less than Significant Impact if Mitigation is Determined to be Feasible and Made a Condition of Approval] [Significant Unavoidable Impact if Mitigation is Determined to be Infeasible]**

Impact EMR-2: While the nature and location of the proposed land uses would serve to place jobs and housing in proximity to each other and to transit services, and in southern Santa Clara County thus reducing overall commute lengths, the increase in gasoline consumption would be substantial when compared to currently projected gasoline demand. Therefore, adoption of a statement of overriding considerations will be required. **[Significant Unavoidable Impact]**

Impact EMR-3: The project site does not contain mineral deposits of statewide or regional significance. **[No Impact]**