



Solar Energy:

As the Cost of This Resource Becomes More Competitive With Other Renewable Resources, Applications to Construct New Solar Power Plants Should Increase

January 2008 Report 2007-119



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The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

As requested by the Joint Legislative Audit Committee, the Bureau of State Audits presents its audit report concerning the siting and permitting of large solar power plants—those of at least 50 megawatts—and related transmission lines.

This report concludes that although the State has set goals for increasing the use of electricity generated from renewable sources such as wind, geothermal, and solar, several factors have contributed to the lack of development of solar power plants. These factors include the lower cost of electricity generated from other renewable sources, the need for large investments in land and infrastructure, and an unproductive incentive system designed to help firms that generate power from renewable sources meet their costs. However, actions by the State and a changing energy market appear to have spurred interest in solar power plants in California.

Our review also concluded that a developer wishing to build a new large solar power plant generally will follow one of four possible approval tracks, depending on the type of plant proposed and the government agency that has jurisdiction over the land on which the new plant will be built. Each track has three primary components: land use review, environmental review, and review of related infrastructure such as new or upgraded transmission lines and interconnection to the power grid.

A review of recent nonsolar related applications (the State last approved a large solar power plant in 1990) indicates that the average time for obtaining approvals to build a power plant, transmission lines, and interconnect to the power grid, totals about 39 months. The delays we observed in approving some applications we reviewed were due to factors outside the control of the approval agencies. However, because applications for power plants, transmission lines, and interconnection to the power grid can be processed concurrently, a delay in obtaining one may not necessarily delay another. Finally, the protections provided by each approval process exist to accomplish various goals, but without approved applications for large solar power plants we did not determine whether certain aspects may be unnecessary or overly burdensome.

Respectfully submitted,



ELAINE M. HOWLE
State Auditor

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Summary

Results in Brief

Electricity lights our homes; cooks our food; and powers our computers, television sets, and other electronic devices. However, on several occasions over the last five years, Californians curtailed their consumption of electricity to prevent larger outages. These curtailments are reminders of California's need to increase the supply of available electricity.

California's largest source of electricity is power plants burning natural gas. To help meet the State's need for electricity, as well as to reduce the harm that using fossil fuels such as natural gas can cause to the environment and to become less reliant on imported fuels, the State has enacted legislation to increase the amount of electricity generated from renewable sources, such as wind, geothermal, and solar energy.

Solar power offers an attractive approach to help meet peak demands for electricity, but the availability of other renewable sources that cost less, the need for large investments in land and infrastructure, and an unproductive incentive system designed to help firms that generate power from renewable sources meet their costs have contributed to a lack of development of solar power plants. However, the State and the changing energy market are beginning to address the negative effects of those three factors.

Steps have been taken that should result in more applications to develop large solar power plants, but the processes of obtaining the approvals necessary to construct a large solar power plant and transmit the electricity it will generate are complex. A developer wishing to build a large solar power plant generally will follow one of four possible approval tracks, depending on the type of plant proposed and the government agency that has jurisdiction over the land on which the new plant will be built. Each of the four approval tracks has three principal components: land use review, environmental review, and review of related infrastructure such as transmission lines or interconnection to the power grid. However, regardless of which track a developer uses, no single entity is responsible for providing all the approvals necessary to begin providing electricity generated by a large solar power plant to consumers.

To build a large solar power plant, a developer must ensure that the uses permitted in the federal or local land use plan include large solar power plants. If they do not, the developer must obtain approval of amendments or changes to the plan. Reviews of environmental impacts are also an integral piece of the approval

Audit Highlights . . .

Our review of the siting and permitting process for large solar power plants revealed the following:

- » *Although the State has set goals for increasing the use of electricity generated from renewable sources, no applications to build large solar power plants have been approved since 1990.*
- » *Several factors have contributed to the lack of development of large solar power plants, including other renewable sources that cost less, the need for large investments in land and infrastructure, and an unproductive system designed to help meet the higher cost of producing electricity from renewable sources.*
- » *Developers wishing to build a large solar power plant generally will follow one of four possible approval tracks, depending on the type of plant proposed and the government agency that has jurisdiction over the land on which the new plant will be built. Each of the four approval tracks includes three major components: land use review, environmental review, and review of related infrastructure such as new or upgraded transmission lines and interconnection to the power grid.*
- » *The various roles filled by each agency and the protections provided by each approval process exist to accomplish various goals. Without approved applications for large solar power plants, we did not determine what aspects may be unnecessary or overly burdensome.*

process. These reviews require the involvement of the public and agencies with jurisdiction over the area. Besides land use and environmental reviews, a developer must obtain approval to interconnect the proposed power plant to the power grid and may need to build or upgrade long transmission lines from the power grid to the remote locations where solar energy is abundant.

Because no applications to build large solar power plants have been approved since 1990, the type of analysis we could perform was constrained. Moreover, environmental review is a process that varies based on the unique characteristics of the project and involves different agencies depending on those characteristics. Although project comparisons were limited, because the approval process is the same for applications for all large thermal power plants whether solar or not, we analyzed recent applications for large nonsolar thermal power plants that the State Energy Resources Conservation and Development Commission (energy commission) had approved.¹ We also reviewed applications for new transmission lines related to other types of power generation, as well as applications to connect other types of power plants to the power grid.

For the 15 approved applications for nonsolar powerplants we reviewed, the approval process took an average of 674 days, 309 more than the established 365-day timeline. For two applications that we reviewed in more detail, delays in this process were largely the result of factors over which the energy commission has no control, such as applicants changing their applications or failing to provide information in a timely manner. Similarly, although the California Public Utilities Commission (utilities commission) has a 365-day timeline for approving applications for transmission lines, it took an average of 187 days longer, for an average total of 552 days, to approve the three applications we reviewed. Again, factors such as the opposition of a city through which a transmission line was to be routed and waiting for the environmental review from a federal agency caused the utilities commission to take longer than its established timeline. Finally, for the 10 applications to connect to the power grid that we reviewed, the approval process used by the California Independent System Operator (CAISO) took an average of seven months longer than its established two-year timeline. The CAISO only recently took over the responsibility, however.

Because some of the required approval processes can be performed concurrently, a delay in obtaining one approval may not necessarily delay the entire process, and although they sometimes contribute

¹ In our report, we refer to this commission as it is named in state law. However, on its Web site and letterhead, the commission refers to itself as the California Energy Commission.

to the delays, the environmental reviews mandated by law are a significant aspect of the process. Although the approval processes used by the different agencies were established to accomplish certain goals, without applications for large solar power plants we did not determine if the costs of these processes were justified by the benefits the different processes provided.

Agency Comments

The energy commission and the utilities commission responded in writing to our report. While not disputing any information we presented, the two commissions provided additional information related to specific topics we addressed. Further, the utilities commission provided information on recent events intended to address challenges for developing transmission infrastructure and for administering the interconnection queue. The CAISO opted not to respond formally to our report.

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Introduction

Background

Electricity is essential to many aspects of our lives. It lights our homes; cooks our food; and powers our computers, television sets, and other electronic devices. However, when the amount of electricity consumed approaches the amount available, outages can occur. On four occasions since June 2002, California’s consumption of electricity was curtailed to prevent larger outages. These curtailments are reminders of the need to increase the supply of available electricity in California to keep up with a demand that the State Energy Resources Conservation and Development Commission (energy commission) forecasts will continue to rise. However, that effort must be balanced with concerns over the environmental impact of electricity production.

Information from the energy commission shows that more than half of California’s electricity comes from power plants burning nonrenewable fossil fuels like natural gas and coal (see the text box).² Burning fossil fuels creates emissions, including greenhouse gases.³ Concerns about the environmental effects of using fossil fuels and the reliance on imported fuels have led the State to recognize the importance of developing renewable sources of electricity.

In 2002 the State enacted legislation creating the California Renewables Portfolio Standard Program (renewables portfolio program) to increase the amount of electricity generated from renewable sources, such as wind, geothermal, and solar energy. The legislation requires entities such as investor-owned electric companies to obtain an increasing percentage of their electricity from renewable sources.⁴ It also encourages publicly

Conventional Sources	
Natural gas	41.5%
Large hydro*	19.0
Coal	15.7
Nuclear	12.9
Subtotal	89.1%
Renewable Sources†	
Geothermal	4.7
Biomass‡	2.1
Small hydro	2.1
Wind	1.8
Solar	0.2
Subtotal	10.9%
Total	100.0%

Source: 2007 Integrated Energy Policy Report adopted by the State Energy Resources Conservation and Development Commission, December 2007.

* Under state law, a hydropower facility of more than 30 megawatts is considered a conventional power source.

† The State Energy Resources Conservation and Development Commission defines renewable as a power source other than a conventional power source.

‡ Biomass uses wood, grass, or other biological materials as fuel.

² Nonrenewable fuels exist in finite amounts and once consumed are not renewed naturally; renewable sources of energy are replenishable.

³ Greenhouse gases trap the sun’s heat and contribute to rising surface temperatures. Examples include carbon dioxide, methane, and nitrous oxide.

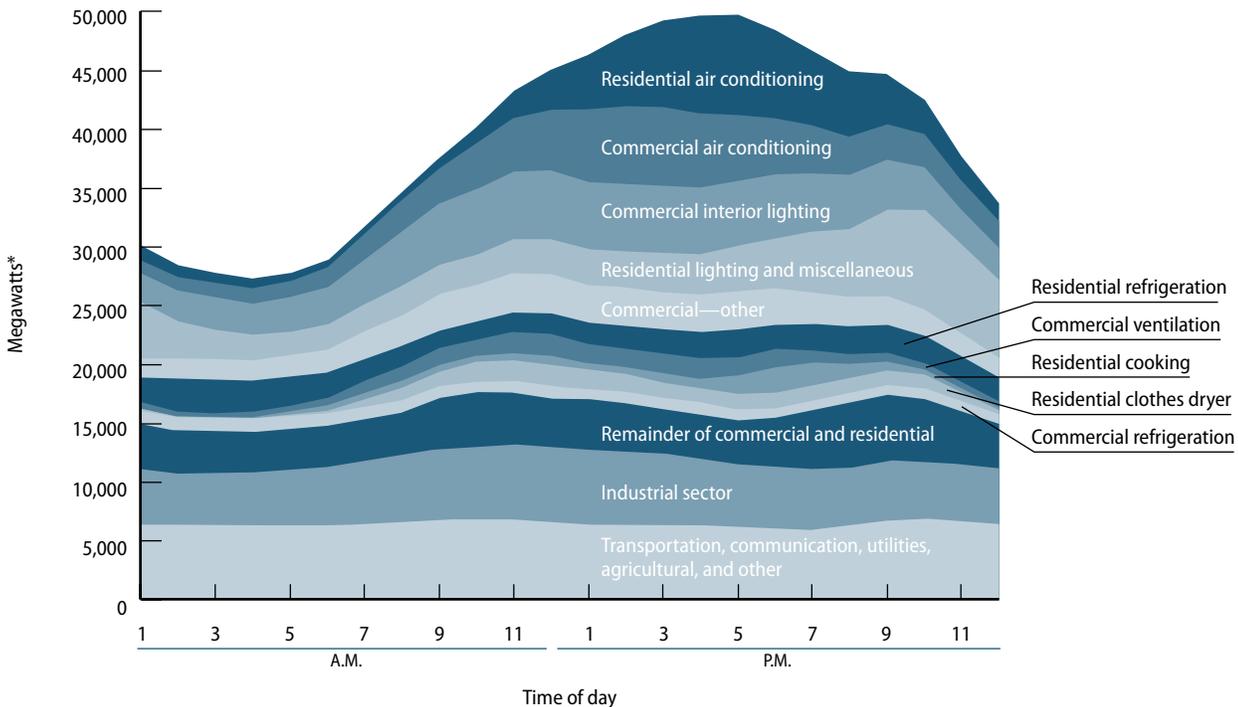
⁴ Investor-owned utilities are publicly traded corporations that provide electrical service for customers and earn profits for shareholders. Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric are examples of investor-owned utilities. Publicly owned utilities are owned by customers who elect boards of directors under legally established monopoly conditions. Publicly owned utilities can be organized into public utility districts to provide electrical service. The Imperial Irrigation District, the Los Angeles Department of Water and Power, the Sacramento Municipal Utility District, and the Turlock Irrigation District are examples of publicly owned utilities.

owned utilities to increase their proportion of electricity generated from renewable sources. The legislation also includes a provision for supplemental energy payments, which the State can award to renewable-energy generators (generators) to cover costs exceeding the market cost for electricity produced from natural gas, as determined by the California Public Utilities Commission (utilities commission).

Solar Power Offers Possible Solutions to Energy Shortfalls and Environmental Concerns

Although the renewables portfolio program is intended to encourage the development of cleaner electricity from renewable sources, not all types of electricity produced from these sources are available during peak-demand periods. According to the energy commission, the demand for electricity is higher in the summer than in the winter. The energy commission also indicated that demand for electricity can vary significantly throughout the day. The highest demand for electricity is often caused by air-conditioner use in the afternoon, as shown in Figure 1.

Figure 1
Typical Peak-Demand Curve



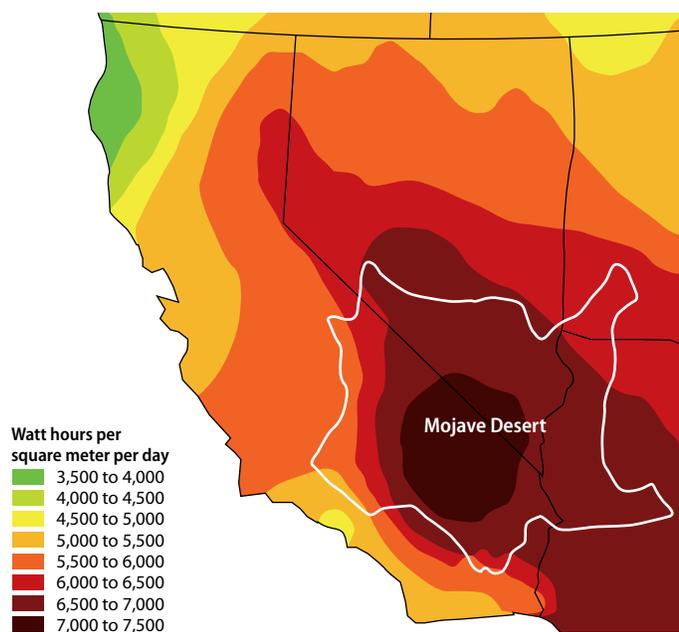
Source: California's Electricity System Supply and Demand Overview, presentation by Jeffrey Byron, Commissioner, State Energy Resources Conservation and Development Commission (energy commission), to the California State Assembly Utilities and Commerce Committee, Informational Hearing, March 29, 2007.

* According to the energy commission, 1 megawatt will provide electricity for approximately 750 homes.

Because electricity is consumed the instant it is generated, balancing generation with consumption is a key concern. For example, according to information from the energy commission, wind generation can peak at various times of the day depending on the season and location. These peak times may not coincide with peak demand, which occurs mid-afternoon to early evening. Solar power offers an attractive approach to help meet the demand for electricity because its period of greatest availability roughly coincides with California's peak-demand time. Solar power generation begins in the morning, when demand for electricity begins to increase, and peaks in the early afternoon, when demand is approaching its highest.

Solar energy is more available in some parts of the country than in others. The amount of energy given off by the sun that reaches a particular area of the earth depends on several variables, including the moisture content of the air, cloud cover, air pollution, and latitude. According to the U.S. Department of Energy's National Renewable Energy Laboratory, California is an attractive location for producing solar power because the Mojave Desert can receive more than twice the solar energy that other parts of the country receive. Figure 2 depicts the amount of solar energy the Mojave Desert receives.

Figure 2
Solar Thermal Resources in California



Sources: United States Department of Energy, Office of Energy Efficiency and Renewable Energy, and United States Department of the Interior, United States Geological Survey.

Figure 3
Thermal Solar Energy Conversion Systems



Trough



Dish/engine system



Power tower

Sources: United States Department of Energy, National Renewable Energy Laboratory.
Photographs from top to bottom by: Geri Kodey; Stirling Energy Systems; and Joe Flores, Southern California Edison.

Two technologies are primarily used to convert solar energy into electricity: thermal systems and photovoltaic systems. Thermal systems use heat to drive a turbine, which is then used to create electricity from generators. Solar thermal systems concentrate sunlight to create the necessary heat. As shown in Figure 3, common types of solar thermal systems are troughs, dish/engine systems, and power towers. The second technology, photovoltaic systems such as solar cells, shown in Figure 4, generates electricity directly from sunlight.

Figure 4
Photovoltaic Solar Energy Conversion System



Solar cells

Sources: United States Department of Energy, National Renewable Energy Laboratory. Photograph: Sacramento Municipal Utility District.

Power Plant Attributes Determine Which Entities Must Approve the Project

Entities at the federal, state, and local levels can be involved in approving the construction of new solar power plants and related transmission lines, as shown in the text box on the following page. The energy commission is responsible for approving applications for thermal power plants of 50 megawatts or more in California, including all new large solar thermal power plants.⁵ Since 1991 the energy commission has received only two applications to construct large solar thermal facilities.

⁵ For the purposes of our report, we refer to power plants of 50 megawatts or more as large power plants. According to the California Independent System Operator, electricity consumption from its portion of the power grid reached a record peak of 50,300 megawatts on July 24, 2006.

Entities That May Be Involved in Approving New Large Solar Power Plants

Federal Bureau of Land Management: Approves rights-of-way for power plants and related transmission lines on BLM-administered lands.

State Energy Resources Conservation and Development Commission: Approves large thermal power plants and related facilities such as transmission lines to the point of interconnection to the power grid on private and federal land.

California Public Utilities Commission: Approves new or upgraded transmission lines after the point at which the generator interconnects to the power grid, for investor-owned utilities.

California Independent System Operator: As a system operator, approves connection of new power plants to the power grid.

Counties and Cities: Approve photovoltaic power plants on nonfederal land, usually through the land use review process.

Sources: Documentation provided by the federal Bureau of Land Management, the State Energy Resources Conservation and Development Commission, the California Public Utilities Commission, and a survey of California counties.

For large solar thermal power plants located on federal land administered by the federal Bureau of Land Management (BLM), both the BLM and the energy commission must give their approval, as outlined in a memorandum of understanding between the two entities. A solar photovoltaic plant falls under the jurisdiction of the local government or the BLM, depending on the plant's location. The BLM has received about 50 applications for large solar power facilities since January 2006. However, the results of our county survey show that California's 58 counties received no applications for siting large solar photovoltaic power plants.

Approvals are also necessary for infrastructure related to new power plants. The utilities commission approves the construction of new or upgraded transmission lines owned or built by investor-owned utilities. These lines transmit electricity across the power grid.⁶ System operators that manage the power grid, such as the California Independent System Operator (CAISO), approve the interconnection of new power-generating facilities to the power grid.⁷

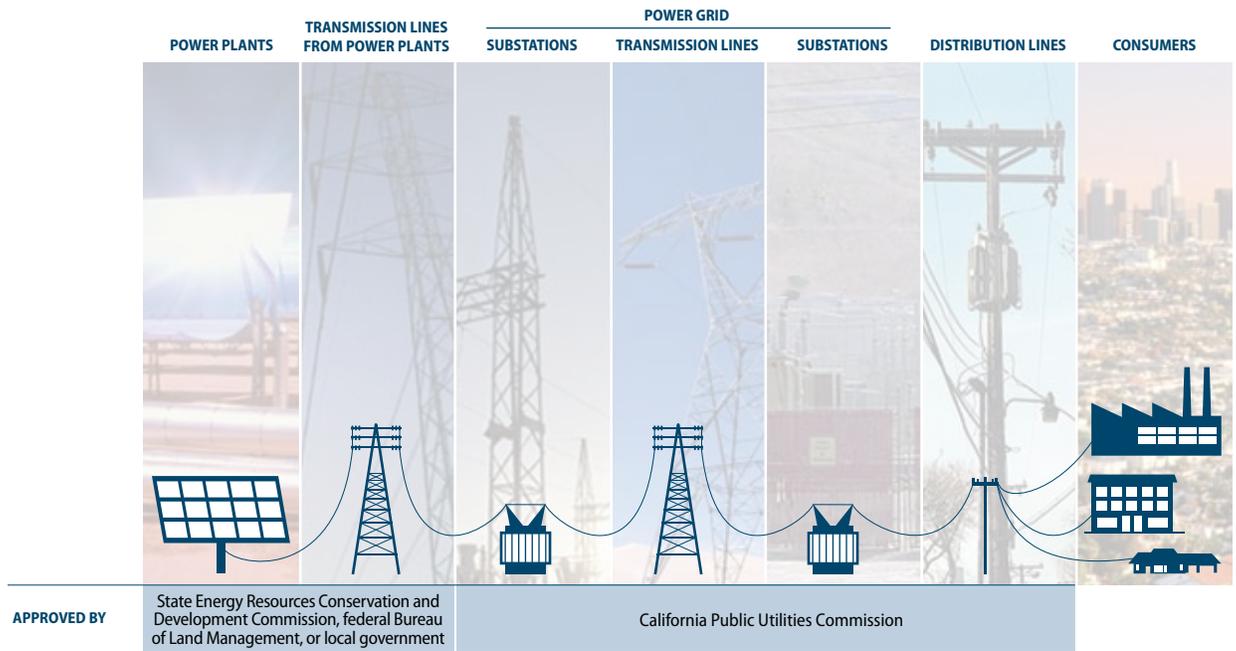
Power Plants Use the Power Grid to Transmit Electricity to Consumers

As shown in Figure 5, the process of generating and transmitting electricity involves a series of facilities and functions that can be approved by numerous entities, including federal, state, and local government agencies. Simply stated, electricity flows across a power grid from generators to consumers. According to the CAISO, the State's power grid is a network of long-distance, high-voltage transmission lines and substations that carry bulk electricity to local utilities for distribution to their customers. The power grid is managed by several system operators responsible for monitoring and controlling the system in real time. The CAISO and four public utility system operators manage portions of the power grid that provide electricity to most areas in the State. In addition, two multistate

⁶ We did not examine as part of our review new or upgraded transmission lines owned or operated by publicly owned utilities, a form of local government; they approve their own transmission infrastructure.

⁷ *Interconnect* is a term of art in the energy industry, and refers to the mutual or reciprocal connection of one system to another. As used in our report, *interconnection* refers to the connection of one system (such as a power plant) to another system (such as the power grid).

Figure 5
Electricity Transmission From Generators to Consumers



Sources: Information provided by the U.S. Department of Energy, the federal Bureau of Land Management, the California Public Utilities Commission, the State Energy Resources Conservation and Development Commission, and federal and state law.

system operators manage portions of California’s power grid that provide electricity to customers along California’s northern border and the area near Lake Tahoe.

Power plants generate electricity that flows to substations over transmission lines. Substations transmit it over the power grid to other substations. From there, the electricity travels through distribution lines to consumers. Three elements of supplying electricity—generating it, transporting it to the power grid, and building new or upgraded transmission lines necessary to accommodate the new electricity—are subject to the approval processes reviewed in this report.

Scope and Methodology

The Joint Legislative Audit Committee (audit committee) requested the Bureau of State Audits to review the siting and permitting of large solar energy power plants and related transmission lines. Specifically, the audit committee requested that we review and assess the process for siting and permitting large facilities generating solar power—those greater than 50 megawatts—and associated transmission lines; determine various statistics related

to that process, such as the number of applications approved since 2002, the number of received applications, the number of denied applications, and the time required for approval; and identify obstacles and recommend measures to streamline the process. The audit committee also requested that we determine the roles and responsibilities of the agencies involved in the renewables portfolio program, how those agencies collaborate and communicate, and if there is any duplication of effort or opportunities for improvement.

At the time of our audit, no applications for large solar power plants had been recently approved. Due to the nature of the application process, significant differences can exist between different types of power plants approved through the same or similar application processes. As such, our use of these data was descriptive; we do not use the nonsolar applications to reach conclusions regarding the amount of time taken to process solar-related applications. Accordingly, we limited our review to specific applications selected from those the agencies provided us for the periods described, and did not perform data reliability procedures for the lists of applications we were provided. During our audit work no additional applications came to our attention through the performance of the audit procedures.

To review and assess the siting and permitting of large solar thermal plants, we interviewed energy commission staff and reviewed the process used by the energy commission. However, the energy commission did not receive any applications for large solar power plants from 1992 through July 2007. We therefore reviewed the last two large solar power plants the energy commission approved in 1989 and 1990. Further, because the energy commission uses a single process to review and approve applications to develop new thermal power plants within its jurisdiction, regardless of the resource used to generate the power, we reviewed the time necessary to approve 15 applications for large power plants powered by resources other than solar energy. The energy commission approved these applications from 2002 through 2006. In reviewing the applications, we determined various dates in the approval process and for two of them identified the cause of the delays. We also looked for opportunities to streamline the process.

To understand the BLM's process for approving solar power plants, we interviewed BLM staff, identified the BLM's policies for assessing and approving right-of-way grant applications for large solar power plants, and determined how the BLM and the energy commission coordinate and cooperate in conducting environmental reviews. Because the BLM administers the federal land in California on which about 50 large solar power plants have been proposed, we limited our review of projects on federal land to those on BLM-administered land.

To determine the siting and permitting processes for large solar power plants that use photovoltaic technology, over which the energy commission does not have jurisdiction, we surveyed California's 58 counties to determine whether they had received any applications to build large solar power plants, and what processes each county would use to approve large solar power plant applications.

To gain an understanding of the role played by system operators in the interconnection of large solar power plants to the power grid, we interviewed staff of the CAISO and reviewed information about the seven system operators we identified. Because the CAISO controls 75 percent of California's power grid, we limited nearly all of our review of system operators to the CAISO. To assess the CAISO's processing of applications to connect to the power grid, we compared the start and approval dates of applications to the CAISO's timeline. Because there were no applications related to large solar power plants, we limited this review to applications from nonsolar power plants approved since May 2006, when the CAISO took over responsibility for administering this process.

To review and assess the siting and permitting process for the construction of transmission lines related to new large solar power plants past the point at which the power plant connects to the power grid, we reviewed procedures and interviewed staff of the utilities commission. We limited our review to those applications submitted to the utilities commission, because it has jurisdiction over the investor-owned utilities subject to the renewables portfolio program. Because there were no applications for transmission line projects related to renewable energy from 2002 through November 2004, we reviewed complete applications for transmission line projects since that time to determine if the utilities commission approved the applications within its established timeline. We then identified the reasons for any significant delays in the processing of these applications.

To determine the roles and responsibilities of the state agencies involved in the renewables portfolio program, how those agencies collaborate and communicate, and if there is any duplication of effort or opportunities for improvement, we reviewed relevant state laws, interviewed staff at the energy commission and the utilities commission, and reviewed the procedures used by each agency to carry out its responsibilities under the renewables portfolio program. Under these procedures the energy commission is charged with certifying renewable resources as being eligible for the renewables portfolio program, developing and maintaining an accounting system to verify compliance with the requirements of the program, and awarding supplemental energy payments to generators of renewable power to cover costs that are above market.

The utilities commission is responsible for approving or rejecting requests from investor-owned utilities to enter into specific contracts for renewable power, including establishing whether a solicitation is adequately competitive; determining investor-owned utilities' annual targets for the purchase of renewable energy; and establishing a methodology for determining the "market price referents," which are benchmarks at or below which contracts will be considered reasonable. Our review of these roles and responsibilities identified no duplication of effort; therefore, we believe the separation of duties appears appropriate and reasonable.

Audit Results

Economic Considerations Have Played a Large Role in the Lack of Applications to Build Large Solar Power Plants

Although the State has set goals for increasing the use of electricity generated from renewable sources, no applications to build solar power plants have been approved since 1990. However, as of October 2007, the State Energy Resources Conservation and Development Commission (energy commission) had received two applications to build new large solar power plants—those producing 50 megawatts or more of electricity—in California. We identified three factors that we believe contributed to the lack of development of solar power plants: the availability of other renewable sources that cost less, the need for large investments in land and infrastructure, and an unproductive incentive system designed to help firms that generate power from renewable sources meet their costs. The State and the changing energy market are only now beginning to address the negative effects of these three factors.

In 2002 the State enacted legislation to encourage the development of environmentally clean, renewable sources of electricity, including solar. However, according to data provided by the California Public Utilities Commission (utilities commission), electricity generated from solar energy has traditionally been more expensive than electricity generated from most other renewable sources. The development of solar power has also been hampered by the requirement for large tracts of suitable land and a scarcity of existing transmission facilities. However, it now appears that the rising cost of natural gas, improvements in technology, and legislative changes have combined to help make solar energy more competitive with electricity generated from other sources.

The California Renewables Portfolio Standard Program (renewables portfolio program) requires investor-owned utilities to increase the acquisition of electricity generated from renewable sources, such as solar energy. Under the renewables portfolio program, investor-owned utilities solicit bids from electricity generators (generators) offering to supply electricity from renewable sources. The investor-owned utilities then evaluate those bids on a least-cost, best-fit basis (see the text box). Each investor-owned utility uses a least-cost, best-fit method that it created and had approved by the utilities commission. After evaluating the bids, an investor-owned utility contracts with a generator

Least-Cost, Best-Fit Criteria Used by Investor-Owned Utilities to Evaluate Renewable Energy Generators

Market Valuation: Such as energy prices, production costs to serve customer demand and transmission costs.

Portfolio Fit: Such as total energy produced and time of delivery.

Credit and Collateral: Such as demonstrating financial strength and creditworthiness.

Project Viability: Such as participant experience and the likelihood of obtaining required permits.

Other Qualitative Factors: Such as location, renewable portfolio standards, water quality impacts, and benefits to minority and low-income areas.

Sources: Bureau of State Audits' review of investor-owned utilities' Renewables Portfolio Standards bid evaluation and selection process and criteria reports.

to obtain electricity from a renewable source. The investor-owned utility pays the market rate or below for the electricity. The generator can then apply to the energy commission for supplemental energy payments to make up the difference between the market rate for electricity and the final bid price for providing the electricity. However, the energy commission indicated that generators have either not completed the required application process or have withdrawn their applications for supplemental energy payments; therefore, no payments have been made.

The Lower Cost of Other Renewable Sources of Electricity Has Provided No Incentive for Utilities to Purchase Electricity Generated From Solar Sources

As the cost of electricity generated from some types of renewable resources increases, electricity from other sources that were once deemed too expensive could become relatively more competitive. The utilities commission indicated that solar thermal and photovoltaic technologies have historically been more expensive than other renewable resources, but economies of scale may drive down the price of these technologies, as they did with wind. However, according to the utilities commission, although wind technology continues to be one of California's lowest-cost renewable sources of electricity, several factors have contributed to an increasing price for electricity generated from wind. These include high worldwide demand for turbines; high demand for renewable power; and, as developers look beyond prime wind resources in some parts of the State, the decreased amount of time generators would produce electricity.

To comply with the legislation implementing the renewables portfolio program, investor-owned utilities must solicit bids from generators to provide electricity from renewable resources and evaluate those bids using their least-cost, best-fit methodology, without regard to the type of renewable resource. The intent of this methodology is to allow an investor-owned utility to select an electricity provider based on the utility's specific resource needs as well as the cost of the project. The least-cost element helps minimize the impact on utility ratepayers of procuring renewable-source electricity. The utilities commission, which is responsible for approving the results of investor-owned utilities' solicitation processes, defines *best fit* as the renewable-source electricity that best meets the utility's general capacity and reliability needs.

Confidential bid data provided by the utilities commission show that solar power generally was not competitive with other renewable sources. In 2005 the average of the lowest bids submitted to each of the three investor-owned utilities to provide electricity from

Solar power generally has not been competitive with other sources of renewable energy.

a solar power plant was 40 percent more than the average of the lowest bids for electricity generated from wind. By 2007, however, the difference had decreased to 19 percent. Further, data provided by the utilities commission show that in 2004 investor-owned utilities submitted, through the renewables portfolio program, only one proposed contract for solar power to the utilities commission for approval, but from 2005 through July 2007, investor-owned utilities submitted six proposed contracts for solar power.

Development of Large Solar Power Plants Requires Large Tracts of Land and Significant New Infrastructure

According to the federal Bureau of Land Management (BLM), large solar thermal power plants require many acres of land to gather enough radiant energy. The BLM anticipates that new solar power plants may require an average of at least 500 acres to produce 100 megawatts of electricity. Additionally, the amount of sunlight reaching the earth's surface is affected by the season, time of day, climate, and air pollution. Information from the National Renewable Energy Laboratory, which is part of the U.S. Department of Energy (Energy Department), indicates that the Mojave Desert has as much as or more potential for the siting of solar power plants than any other region in the country. However, according to energy commission documents, the transmission infrastructure serving the areas does not exist. The energy commission concluded that the absence of this infrastructure has been a crucial barrier to the development of renewable resources such as solar power plants because developers may be unwilling to assume the cost of building the necessary long transmission lines in addition to the cost of plant construction.

The Mojave Desert has as much as or more potential for the siting of solar power plants than any other region in the country.

Supplemental Energy Payments Meant to Encourage the Transition to Renewable-Energy Sources Have Not Been Awarded

The legislation creating the State's renewables portfolio program requires the energy commission to award supplemental energy payments to assist eligible generators of electricity from renewable sources when the cost of the electricity they produce exceeds the market price for electricity (market price referent), as determined by the utilities commission. The energy commission reported in March 2007 that \$734 million would be available for these payments. However, the manager of the Renewable Energy Office (office) at the energy commission told us that as of November 2007 it had not awarded any supplemental energy payments to generators under the renewables portfolio program.

One reason for the lack of payments is that most bids for contracts from renewable energy sources such as wind and geothermal generally have not been higher than the market price referent. Another reason no payments have been made is that only new or repowered facilities are eligible for supplemental energy payments; contracts with preexisting facilities are ineligible. In fact, according to office staff, it has received only five applications for supplemental energy payments since the beginning of the renewables portfolio program. The office staff also stated that only one of those applications was complete, and that the developer making the submission subsequently withdrew its application. The office also indicated that some developers were concerned about submitting confidential information to the energy commission and therefore did not provide all of the required information in their applications.

The Removal of Obstacles, Along With the Rising Cost of Natural Gas, Has Heightened Interest in Developing New Solar Power Plants

Although the energy commission has not approved any applications for the construction of large solar thermal power plants since 1990, developers appear to have started viewing solar power as financially viable. As of October 2007 the BLM had received about 50 applications to construct large solar power plants. This activity is relatively recent; the earliest of these applications was received in January 2006. The applications consist of both thermal and photovoltaic technologies and, if all are built, will provide nearly 43,000 megawatts of electricity. The energy commission expects that it will receive about eight applications for large solar thermal power plants in 2008.

As of October 2007 the BLM had received about 50 applications to construct large solar power plants while the energy commission expects to receive eight applications in 2008.

We identified several factors that we believe have spurred this new interest. First, the cost of natural gas has been rising; as shown in Figure 6, the average cost has nearly doubled since 2002. Information from the energy commission shows that the largest fuel source for generating electricity in California is natural gas. As the cost of natural gas has risen, the cost of electricity generated from it has also risen.

Second, recent legislation is intended to make cleaner electricity, such as solar, preferable for utilities over energy produced from sources that generate greenhouse gases. In Chapter 598, Statutes of 2006, the Legislature found that as the largest electricity consumer in the region, California has an obligation to provide clear guidance on performance standards for procuring electricity. The legislation requires the utilities commission, in consultation with the energy commission and the State Air Resources Board, to set emission performance standards for greenhouse gases to be met by investor-owned utilities. It also requires the energy commission to similarly set emission performance standards to be met by publicly

Figure 6
 Price of Natural Gas Used for Electric Power Generation in the United States Since 2002



Source: United States Department of Energy, Energy Information Administration.

owned utilities. The utilities commission adopted standards in January 2007, and the energy commission adopted standards in August 2007. Both sets of standards place limits on the amount of emissions resulting from the generation of electricity purchased by utilities. The legislation also prohibits utilities from entering into contracts with generators for five or more years unless the electricity base load provided under those contracts meets the emission performance standards.⁸ The legislation could effectively prevent utilities from entering into long-term contracts for electricity with generators that use coal as a fuel source. As a result, as existing contracts for coal-generated electricity expire, utilities may need to find replacement sources. Electricity generated from renewable resources, including solar energy, could therefore be attractive alternatives.

Third, recently enacted legislation attempts to make it easier to finance the development of renewable energy. Chapter 685, Statutes of 2007, which became effective in January 2008, removes the energy commission's authority to award supplemental

⁸ Base-load electricity is electricity generated by a power plant designed and intended to provide electricity at a rate of at least 60 percent of its total capacity.

energy payments under the renewables portfolio program. Instead, according to the Senate floor analysis of this legislation, it authorizes the utilities commission to allow investor-owned utilities to recover the cost of electricity from renewable sources that is in excess of market prices by building this cost into electric rates. This new process is intended to make the income stream to the generator more dependable and therefore more attractive to financial institutions that would potentially underwrite the construction of solar power plants.

Fourth, according to a report published by the Energy Department, recent advances in technology are allowing solar energy to be converted into electricity more efficiently. These advances are intended to support the goal of producing cost-competitive solar-generated electricity. For example, the Energy Department has demonstrated a method for converting sunlight to electricity at record levels using one new type of photovoltaic technology. It has also identified another new process that will permit the commercial use of a type of silicon that is less expensive than the type currently used in photovoltaic cells and could foster rapid, large-scale production. The National Renewable Energy Laboratory has also set efficiency records for multilayer photovoltaic cells and states that emerging concepts promise additional breakthroughs in efficiency and affordability. Further, the Energy Department has stated that new solar thermal dish/engine systems have reached unmatched levels of efficiency and are being designed for low-cost, high-volume production.

The federal government is also encouraging the development of renewable alternatives; the Energy Department invited 16 developers to submit full applications for \$2 billion in loan guarantees for clean energy projects from 143 preapplications that use innovative technologies. Among these projects are two from California. Moreover, the federal Energy Policy Act of 2005 could help reduce barriers to building large solar power plants. That legislation seeks to increase federal purchases of renewable energy and urges the federal secretary of the interior to approve renewable-energy projects located on public lands with a generation capacity of at least 10,000 megawatts of electricity over a 10-year period.

The State's largest power grid manager cites insufficient transmission line capacity in remote areas as a significant barrier to the development of renewable resources, including solar energy.

Finally, a proposal by the California Independent System Operator (CAISO) is aimed at encouraging the development of transmission infrastructure for renewable resources by spreading the costs among the users of the power grid. The CAISO, the State's largest power grid manager, cites insufficient transmission line capacity in remote areas as a significant barrier to the development of renewable resources, including solar energy. According to the CAISO, significant renewable resources such as wind, geothermal, and solar energy are not readily accessible to the portion of the power grid it manages. Under the current process, a developer must

pay for transmission lines that connect a power plant to the power grid. Because location-constrained renewable resources are in areas far from the power grid, these transmission lines can be relatively long and expensive to construct.

In January 2007 the CAISO submitted a proposal to the Federal Energy Regulatory Commission, which was approved in April 2007. This proposal for financing and developing transmission facilities is intended to promote the connection of multiple location-constrained resources to the CAISO-controlled power grid. Because generating electricity from renewable sources like solar energy is typically limited to locations where the resource exists (such as areas where solar energy is abundant), long transmission lines may be necessary to reach the remote locations where they are located. Under the proposal, once a transmission owner, such as an investor-owned utility, builds a connection facility, each generator that interconnects would be responsible for paying its proportional share of the costs of using the line. However, until the line is fully utilized by generators, all users of the power grid would pay for the cost of unused portions of the line. In October 2007 the CAISO submitted procedural language to implement this new policy, which the Federal Energy Regulatory Commission conditionally approved in December 2007.

Approvals to Build Large Solar Power Plants Involve Several Entities

The processes of obtaining the approvals necessary to construct a large solar power plant and transmit the electricity it will generate are complex. A developer wanting to build a large solar power plant generally will follow one of four possible approval tracks. The specific track followed is determined by two attributes of the project: the type of solar power plant proposed (thermal or photovoltaic) and the government agency with jurisdiction over the land on which the new plant will be built. Each of the four approval tracks has three principal components: land use review, environmental review, and review of related infrastructure, such as transmission lines and interconnection to the power grid.

Regardless of the type of large solar power plant to be built or the government agency that has jurisdiction over the land, a solar power plant developer must obtain approvals from several entities. A developer must also resolve conditions imposed by government agencies as part of the project's environmental review component. Appeals of decisions can delay the project, lead to the imposition of mitigation measures or alternatives, and in some cases require the agency to reapprove the project after complying with the California Environmental Quality Act (CEQA) and a court order from the appeal.

A developer wanting to build a large solar power plant generally will follow one of four possible approval tracks, each of which includes land use review, environmental review, and review of related infrastructure.

Without any recently approved applications for large solar power plants to review, we could not conclude that any one of the four approval tracks is more time-consuming or onerous than the others.

Developers are planning many new solar power plants in California. As of October 2007 the energy commission had received two applications for constructing large solar thermal power plants. Further, developers have submitted nearly 50 applications for constructing large solar power plants to the BLM. However, because no applications have recently gained approval, our ability to analyze the approval process was limited. The energy commission last approved an application for a large solar thermal power plant in 1990. Further, one of the BLM's program managers indicated that the BLM has not approved any applications for new large solar power plants on federal land in California, and in response to our survey, all 58 counties in the State indicated that they had not approved construction of any large solar power plants.

Because of the absence of recently approved applications, we reviewed applicable written procedures established by the approval agencies for reviewing applications to build new large solar power plants. Our reviews disclosed no unreasonable impediments in the procedures. We also reviewed the energy commission's processing of applications for power plants fueled by resources other than solar energy, a system operator's processing of requests to interconnect to its portion of the power grid, and the utilities commission's processing of applications for transmission lines past the point of interconnection to the power grid. However, without any recently approved applications for large solar power plants to review, we could not conclude that any one of the four approval tracks is more time-consuming or onerous than the others.

Power Plant Approval Can Follow One of Four Tracks

The table shows four possible approval tracks for a new solar power plant. The first track is for large solar thermal power plants to be built on nonfederal land. State law assigns exclusive jurisdiction to approve applications for large thermal power plants, including large solar thermal power plants, to the energy commission. This process is part of the State's goal to protect environmental quality and ensure a reliable and affordable supply of electricity.

The second track is for large solar thermal power plants to be constructed on federal land administered by the BLM. According to BLM policy, applications for commercial solar energy facilities will be processed as right-of-way authorizations under the Federal Land Policy and Management Act and the Code of Federal Regulations. The BLM reviews applications to build on land under its jurisdiction and, upon approving an application, grants a right-of-way that allows the developer to use the land for the purpose specified in the application. To reduce duplication of effort during the environmental review component of the approval process, the BLM and the energy commission entered into a memorandum of understanding

in August 2007 that documents the relevant roles, responsibilities, and procedures each agency will follow when conducting a joint environmental review.

Table
Approval Tracks for Large Solar Power Plants Included in Our Review

NECESSARY APPROVALS	SOLAR FACILITY TECHNOLOGY			
	THERMAL JURISDICTION		PHOTOVOLTAIC JURISDICTION	
	NONFEDERAL	ADMINISTERED BY THE FEDERAL BUREAU OF LAND MANAGEMENT (BLM)	NONFEDERAL	ADMINISTERED BY THE BLM
Land use	Local government*	BLM	Local government	BLM
Environmental review†	Energy commission	BLM and energy commission	Local government	BLM‡
Related infrastructure				
Power grid interconnection	System operator (such as the California Independent System Operator (CAISO))	System operator (such as the CAISO)	System operator (such as the CAISO)	System operator (such as the CAISO)
Install new or upgrade existing transmission lines§	California Public Utilities Commission (utilities commission)	Utilities commission	Utilities commission	Utilities commission

Sources: Federal and state regulations, and information obtained from the State Energy Resources Conservation and Development Commission (energy commission), the CAISO, and the utilities commission.

* The energy commission can override land use decisions made by local governments.

† The environmental review process may include significant involvement from other government agencies.

‡ According to one of its associate district managers, the BLM is in discussion with some California counties to gauge interest in participating in joint environmental review processes.

§ From the point the power plant connects to the power grid, for investor-owned utilities.

The third track is for large solar photovoltaic power plants to be built on nonfederal land. State law specifically excludes photovoltaic power plants from the energy commission’s jurisdiction over large solar thermal power plants. State law authorizes local governments to engage in land use planning. Since state law does not require any state agency to approve those power plants, authority for approving this type of solar power plant rests with the county or city in which the project will be built. California has 58 counties and nearly 480 cities, each with broad discretion in creating land use plans and reaching land use decisions. Because of this discretion, a developer may need to obtain different land use approvals to build a large photovoltaic solar power plant in one location than it would in another.

The fourth track is for large solar photovoltaic power plants to be built on BLM-administered land. Similar to the second track, the BLM reviews applications to build on land under its jurisdiction. However, the energy commission does not have jurisdiction

over photovoltaic power plants; therefore, unlike the process for obtaining approval for a large thermal solar power plant, no joint federal and state environmental review process exists. According to the associate district manager of the BLM's California Desert District, the BLM is currently in discussion with several California counties that fall within the district's boundaries to determine their interest in participating in joint environmental review processes.

Local Land Use Approvals Are Necessary

Regardless of which track a developer uses, no single entity provides all necessary approvals to begin delivering electricity generated by a large solar power plant to consumers. Because each county and city has considerable flexibility in specifying the appropriate use of its land, the building of large solar power plants within a county or city may require approval of land use changes. Generally, for new construction on land under county or city jurisdiction, local officials establish guidelines through general and specific plans, zoning, and other land use planning mechanisms. Unless a county or city has already determined that a large solar power plant is an appropriate use for a specific parcel of land, a developer must apply for approval from the county or city to use the land for that purpose.

State law requires each county or city to adopt a general plan that specifies a comprehensive, long-term approach to its physical development. Land use is one element required in all general plans. This element contains information on the general distribution, location, and extent of the uses of the land for housing, business, open space, and other categories of public and private uses. A developer proposing a use not specified in the general plan (such as building a large solar power plant) must apply for an amendment to the plan. The legislative body of each county or city is responsible for approving any general plan amendments.

According to the Governor's Office of Planning and Research (Planning and Research), one unit of which is responsible for, among other things, coordinating the state level review of environmental documents pursuant to the CEQA and providing technical assistance on land use planning and CEQA matters, development must meet not only the broader policies set forth in the general plan but also the specific requirements of the zoning ordinance. Planning and Research describes a zoning ordinance as a local law that spells out the immediate, allowable uses for each piece of property within a community. All counties and certain cities can consider requests for zoning changes. If a county or city zoning ordinance does not allow the building of a large solar power plant, a developer must apply to have the county or city rezone the land to allow it.

In some situations a developer might be unable to obtain the required change in land use decisions from a county or city. If the project being considered is a large solar thermal power plant,

If a developer was unable to obtain the required change in land use decisions from a county or city and the project being considered is a large solar thermal power plant, the energy commission can override the negative decision by the county or city and allow the project to move forward.

the energy commission can override the negative decision by the county or city and allow the project to move forward. According to the energy commission's siting office manager, out of more than 130 applications, the energy commission has overridden local decisions regarding land use designations in four instances. In contrast, if the proposed project is a large photovoltaic facility, no state entity has general jurisdiction. Thus, the local land use decisions would govern whether such a facility could be developed in the jurisdiction.

If a piece of land is already zoned for a broad purpose (such as industrial use) that might allow a new solar power plant but does not specifically describe that use, the developer must apply for a conditional-use permit from the county or city. According to Planning and Research, the conditional-use permit is intended to allow a county or city to consider a special use that could be essential or desirable to a particular community and to provide flexibility within a zoning ordinance. According to its siting office manager, the energy commission permit is issued in lieu of a local government conditional-use permit. However, the energy commission typically requires compliance with the same criteria the local government would require for a conditional-use permit.

Federal land in California is subject to federal land use decisions. For BLM-administered land, resource management plans established under federal law define allowable resource uses. Sites associated with power generation, such as large solar power plants, or transmission lines not identified in a resource management plan are considered through the plan amendment process.

Environmental Reviews Under the CEQA and the National Environmental Protection Act Are Also Necessary

The second component of each of the four approval tracks is environmental review. Environmental reviews conducted under the National Environmental Policy Act (NEPA) and the CEQA are an integral piece of the approval process of building a large solar power plant. Under the NEPA, a federal government agency acts as the lead agency, and sometimes acts as a joint lead agency with state or local government. Under the CEQA, state or local government entities act as lead agencies. Lead agencies are responsible for approving projects; for preparing environmental documents; and, under the CEQA, for preventing significant, avoidable damage to the environment by requiring the use of alternatives or mitigation measures that the lead agency determines are feasible.⁹

According to one of its managers, the energy commission issues a permit in lieu of a local government conditional-use permit, but typically requires compliance with the same criteria the local government would require.

⁹ The energy commission is exempt from the provisions of the CEQA; the secretary of the California Resources Agency certified the energy commission's process as functionally equivalent to a review under the CEQA.

According to *The Community Guide to the California Environmental Quality Act*, published by the Planning and Conservation League Foundation, the CEQA is California's premier environmental law. According to Planning and Research, it was enacted by the Legislature as a system of checks and balances for land use development and management decisions in the State. The CEQA defines a project as an activity that may cause either a direct physical change or a reasonably foreseeable indirect physical change in the environment. Therefore, the CEQA broadly defines the word *project*. Because the construction of large solar power plants would change the environment physically, such projects fall under the authority of the CEQA.

Recognizing that various governmental agencies have expertise in and jurisdiction over specific subjects, a lead agency must consult with other governmental agencies as part of the environmental review. For example, if a project is expected to affect endangered or threatened wildlife or will be in close proximity to a stream, the lead agency will involve the California Department of Fish and Game (Fish and Game) because of its responsibilities related to endangered and protected species and their habitat. In this situation Fish and Game is a responsible agency under CEQA because the project will need a permit from Fish and Game before it can proceed. Even if Fish

and Game's approval is not needed, because Fish and Game is the State's trustee agency for fish and wildlife resources, the lead agency must still consult with Fish and Game as a trustee agency. Because the characteristics of projects vary, the government agencies that provide approval will also vary. For example, depending upon the amount of air emissions generated by the construction of a proposed solar power plant, a local air quality management district may need to give its approval. Responsible and trustee agencies will rely upon the lead agency's environmental review to address their concerns.

Once a lead agency determines that the project it is reviewing is subject to CEQA, it typically conducts an initial study to determine whether the proposed project may have a significant adverse effect on the environment. Prior to making this determination the lead agency must consult with all responsible and trustee public agencies and seek their comments on the environmental consequences of the proposed project. Based on the results of this initial study and the comments it has received from the responsible and trustee public agencies, the lead agency can elect to

Types of Environmental Analysis Prepared by State and Local Agencies Under the California Environmental Quality Act

Environmental Impact Report: A detailed written document prepared under the California Environmental Quality Act (CEQA) describing and analyzing the significant environmental effects of a project and discussing ways to mitigate or avoid the effects.

Negative Declaration: A written document briefly describing the reasons that a proposed project not exempt from the CEQA will not have a significant effect on the environment and therefore does not require the preparation of an environmental impact report.

Mitigated Negative Declaration: A negative declaration that can be prepared when the initial study has identified potentially significant environmental effects, but changes to the project before the proposed negative declaration and initial study are released would mitigate those effects to the point where there is clearly no significant effect on the environment.

Source: California Code of Regulations, Title 14.

prepare a negative declaration, a mitigated negative declaration, or an environmental impact report (EIR), as described in the text box. Planning and Research stated that the EIR records the scope of the developer's proposal and analyzes its known environmental effects. The EIR must identify, among other things, any significant effects on the environment, alternatives to the project, and proposed measures to minimize the significant effects. The EIR contains many sections that document each element of the environmental review. For example, the EIR should identify required permits and other approvals required to implement a project. Agency and public comments and recommendations are also included in the EIR.

Before the lead agency can approve any project, including a solar energy project, the lead agency must circulate its environmental review document for public review and comment. For a negative declaration or a mitigated negative declaration prepared for a proposed solar power project, the public review and comment period will likely be 30 days. For an EIR prepared for a proposed solar power project, the public review period will likely be 45 days. In the case of an EIR, the lead agency must prepare responses to all public comments received on the EIR, and include the comments and responses in the "final" EIR.

After the public review and comment period the lead agency must adopt the negative declaration and mitigated negative declaration, or certify that the final EIR has been completed in compliance with CEQA and adopt findings demonstrating that all feasible mitigation measures and alternatives have been adopted *before* the lead agency can approve the proposed project.

Steps have been taken to require the CEQA review to be completed in a timely manner, but some actions are exempt from these requirements. The Permit Streamlining Act (act) added timelines and deadlines to projects under the CEQA to expedite government review, but not all projects are subject to the provisions of the act. For example, the energy commission's process is exempt from the provisions of the act, and according to materials published by Planning and Research, legislative actions, such as zoning amendments and ministerial actions, such as the issuance of some building permits, are also exempt from the act.

Appeals of decisions under the CEQA can delay a project, lead to the imposition of mitigation measures or alternatives, and in some cases require the lead agency to reapprove the project after complying with the CEQA and a court order from the appeal. According to the *California Environmental Law and Land Use Practice*, a legal treatise published by Matthew Bender and Company, public participation in the CEQA process has been instrumental in ensuring that government agencies comply with the law. It also stated that the

opportunity for the public to participate in the process required by the CEQA is so important that one court held that persons submitting comments as part of the public review are subject to absolute immunity from tort liability, regardless of their motives or the content of their comments.

In addition to meeting environmental requirements, an applicant may need to have its plans reviewed by a local government to obtain necessary permits for tasks such as building, grading, or erosion control. According to the deputy district manager of resources for the BLM's California Desert District, although the BLM does not require applicants to obtain a building permit from the applicable local government, it does require a project's development plan to comply with all local and state laws, including applicable building codes.

Under state law, the certification of solar thermal power plants by the energy commission is in lieu of any other permit, certificate, or similar document (such as an EIR required under the CEQA) required by any state, local, or regional agency or federal agency to the extent permitted by federal law. However, the secretary of the California Resources Agency has certified the energy commission's process as functionally equivalent to a review under the CEQA. Therefore, the energy commission may use staff assessments that include a review of environmental factors, among others, in place of documents required by the CEQA. Further, state law requires the energy commission to determine whether a project conforms with applicable air and water quality standards and with applicable local, regional, state, and federal standards, ordinances, or laws. As such, the energy commission, according to its siting office manager, requires developers to apply for the necessary land use and other approvals themselves if they are not in conformance with local land use requirements.

State law requires the energy commission to determine whether a project conforms with applicable air and water quality standards and with applicable local, regional, state, and federal standards, ordinances, or laws.

According to the U.S. Geological Survey, the NEPA is the cornerstone of our nation's environmental law and was enacted to ensure that information about the environmental effects of any federal or federally funded action is available to public officials and citizens before decisions are made or actions taken. The NEPA includes procedural requirements that apply to all federal agencies and regulate decisions for actions, including financing, assisting, conducting, or approving projects or programs; agency rules, regulations, plans, policies, or procedures; and legislative proposals. As a federal agency, the BLM will conduct an analysis in accordance with the NEPA before it grants a developer a right-of-way.

The CEQA and NEPA have many similarities, but they also differ in several respects. The primary purpose of both laws is to require agencies to consider the environmental impacts of projects during the planning and review process. Additionally, both laws create a

process that calls for public participation. One notable difference pertains to the obligations that these laws impose on agencies to mitigate potential adverse environmental impacts caused by a project. The NEPA requires agencies drafting environmental documents to provide a detailed statement regarding adverse impacts of the project that cannot be avoided as well as a discussion of measures to mitigate adverse environmental impacts. However, the NEPA does not require a complete plan for mitigating those adverse impacts, nor does it require that those mitigation measures be implemented. In contrast, under the CEQA, if the environmental impact of a project is declared to be “significant,” the lead agency is required to determine that sufficient measures have been taken to mitigate the impact where feasible. If the agency finds that such measures are not feasible, it must adopt a statement of overriding consideration, which states the specific reasons why the project’s benefit outweighs those effects that have not been mitigated. Thus, mitigating the adverse environmental impacts of a proposed project plays a more significant role under the CEQA.

Related Infrastructure Requires Additional Approvals

Besides land use and environmental reviews, an interconnection customer, such as a developer, must obtain approvals from other entities for infrastructure related to a new solar power plant. For instance, an interconnection customer must also obtain approval from a system operator to interconnect its power plant to the power grid. As described in the Introduction, the State relies on a complex power grid to transmit electricity from power plants to consumers. A key participant in this interconnection process is the system operator. Although several of the State’s publicly owned utilities manage portions of the power grid, the CAISO is the largest system operator, controlling 75 percent of the grid.

To standardize the interconnection of a power plant to its portion of the power grid, the CAISO adopted a process prescribed by the Federal Energy Regulatory Commission. Under this process, interconnection customers must submit interconnection requests to the CAISO. The CAISO enters the requests into a queue consisting of earlier filed requests. Part of the CAISO’s mission is to operate the power grid reliably and efficiently and to promote infrastructure development. Therefore, before approving a request, the CAISO conducts or directs a transmission owner to conduct studies to ensure that the power grid can reliably handle the additional electricity. These studies are conducted based on the interconnection customer’s order in the queue. Placement in the queue also determines which interconnection customer is responsible for paying for the facilities necessary to accommodate the request. According to the CAISO’s director of state affairs, if an interconnection customer withdraws its

Before the CAISO approves a developer’s request to connect a new power plant to the power grid, studies are conducted to ensure that the power grid can reliably handle the additional electricity.

application, it may be necessary to restudy the remaining requests to determine who must pay for upgrades and in what order. The CAISO and the transmission owner then draft a standardized connection agreement and related appendices and offer it to the interconnection customer. All three entities negotiate aspects of the appendices. The transmission owner and the CAISO then provide a final agreement to the interconnection customer for execution.

The Federal Energy Regulatory Commission (regulatory commission) held a conference in December 2007 to discuss challenges in managing interconnection queues, related in part to an increase in applications for power plants using renewable resources. In response to the conference and a request from the regulatory commission, the CAISO initiated a stakeholder process to evaluate reforms to its current interconnection procedures. The CAISO anticipates presenting its proposal to the regulatory commission in March 2008.

We determined that two public utilities that manage their portions of the power grid—the Sacramento Municipal Utility District and the Imperial Irrigation District—follow procedures similar to the federally established process used by the CAISO. In addition, according to its assistant chief operating officer, the Los Angeles Department of Water and Power (Los Angeles power department) has a procedure comparable to the CAISO's federally approved process, but it has yet to be approved by the Los Angeles power department's board of commissioners and the Los Angeles City Council. Conversely, according to the manager of its electrical engineering department, the Turlock Irrigation District does not use a process comparable to the federal process. Of these four public utilities, the Imperial Irrigation District and the Los Angeles power department maintain interconnection queues that contained only 32 requests as of October 2007. The Turlock Irrigation District has not received any requests to connect to its power grid, and the Sacramento Municipal Utility District has not received an interconnection request since it adopted the federal process. In contrast, the CAISO had 206 active requests in its queue as of September 2007.

When new transmission lines or upgrades to the power grid are necessary to transmit the additional power produced by a new power plant, investor-owned utilities must obtain approval from the utilities commission.

Substations and transmission lines are other types of infrastructure related to solar power plants. When new transmission lines or upgrades to the power grid are necessary to transmit the additional power produced by a new power plant, investor-owned utilities—which own transmission lines—must obtain approval from the utilities commission. Conversely, publicly owned utilities obtain approval to build or operate their own transmission lines from their elected boards or commission. If a proposed large solar power plant requires a new or upgraded transmission line of 200 kilovolts or more, the investor-owned utility must apply for and obtain a certificate of public convenience and necessity (certificate) from the utilities

commission.¹⁰ According to the utilities commission, the certificate may be granted if the line will provide increased reliability, is justified on economic grounds such as providing access to lower cost power, or facilitates goals related to renewable power. The Public Utilities Code states that an application for transmission lines is deemed necessary if the utilities commission determines that the project would help meet the goals of the renewables portfolio program.

In July 2006 the executive director of the utilities commission established directives to streamline the approval of transmission facilities. An investor-owned utility seeking a streamlined review must notify the director of the utilities commission's Energy Division in writing at least six months before filing an application. These notifications allow the investor-owned utility and the utilities commission to identify potential deficiencies before the investor-owned utility files an application with the utilities commission. Within 30 days of receiving an application, the utilities commission determines whether the application is complete or deficient. If an application is deficient, the utilities commission notifies the investor-owned utility in writing, identifying the deficiencies. If an application is complete, the utilities commission begins the process of meeting the requirements of the CEQA by deciding which environmental document to prepare. If the project crosses federal land, it is also subject to environmental review under the NEPA. According to the utilities commission it generally enters into a memorandum of understanding with the relevant federal agency (usually the BLM or the U.S. Forest Service) to collaboratively conduct a joint environmental process.

For the most part, developers and the investor-owned utilities can initiate the process of obtaining from government agencies the necessary approvals concurrently, or in any order. In certain instances, however, a developer needs to secure approvals in a particular order. For example, a developer must obtain an approved system impact study from a system operator before the energy commission can approve the application. Further, although state law allows the submission of applications to the utilities commission, which has jurisdiction over investor-owned utilities—concurrently with applications to other agencies, such as a power plant being considered by the energy commission, it forbids the utilities commission from approving such a project until the application for the power plant receives approval from the energy commission.

¹⁰ For any power line between 50 and 200 kilovolts, the utilities commission issues a permit to construct.

Applications We Reviewed Went Through Processes Similar to Those Required for Some Types of Solar Power Plants

Although the absence of approved applications for large solar power plants constrained the type of analysis we could perform, we assessed other applications that were subject to the same approval processes. As we described earlier, although every application is a reflection of the unique characteristics of the project, the relevant agency must conduct an environmental review that meets the requirements of the CEQA, the NEPA, or both. In addition, developers generally must obtain permission to connect their generating facilities to the power grid. Also, if an investor-owned utility needs new or upgraded transmission lines, the utilities commission must review, and if appropriate, approve those lines.

To estimate how long the applications for a new large solar power plant might take, we identified comparable projects and obtained data on timelines and the obstacles some projects experienced. Because the agencies managing these processes depend on data from the applicant and must consider the input of other agencies, they are not always able to meet their established timelines. However, because developers have the ability to obtain some approvals concurrently, a delay in obtaining one may not delay obtaining others.

Approvals for Power Plants Can Be Delayed Because of the Need for Additional Project Data or Design Changes

To estimate the amount of time it could take a developer to obtain approval for building a large solar power plant, we reviewed two applications the energy commission approved in 1989 and 1990 for large solar thermal power plants and 15 more recent applications for nonsolar power plants that use the same approval process as that required by the energy commission for solar thermal power plants. Although the energy commission has a timeline for processing applications for all thermal power plants regardless of the type, we found that unique project specifications, unique environmental characteristics, and project changes can affect the ability of the energy commission to meet this timeline. The delays we observed in the approval process and the reasons for them are consistent with the results presented in our August 2001 audit report titled *California Energy Commission: Although External Factors Have Caused Delays in Its Approval of Sites, Its Application Process Is Reasonable*.¹¹ As in our earlier review, we found that the delays in the process for the two applications we reviewed in more detail have

Unique project specifications, unique environmental characteristics, and project changes affected the ability of the energy commission to meet its timeline for processing applications.

¹¹ In our August 2001 report, we provide more details about the process the energy commission uses to consider applications for new power plants.

been caused by factors outside the energy commission's control, such as developers failing to provide required information in a timely manner or making changes to the site or design.

The energy commission processed the two solar power plant applications within the established one-year timeline but took longer to process more recent applications for nonsolar power plants. Processed from 1988 through 1990, the two solar projects were related to the Solar Electric Generating System and are the most recent applications for solar thermal power plants the energy commission approved. The Solar Electric Generating System projects are solar trough systems and also use natural gas-fired heaters to provide supplementary power during inclement weather, evenings, and winter months.

Because the energy commission approved these two solar applications more than 17 years ago, and it uses the same process for approving applications for both large solar and nonsolar thermal power plants, we reviewed 15 applications for large nonsolar thermal power plants the energy commission approved from 2002 through 2006. Our review revealed that for all 15 applications, the energy commission took longer than the 365-day timeline. On average, it took 674 days to approve them. The longest processing time was for a natural gas-fired power plant located in Blythe, which exceeded the energy commission's 365-day timeline by 881 days, or nearly two and one-half years.

The difference between the processing time of the two older applications and the 15 more recent ones can be partially explained by similarities of the two applications to earlier plants. The two older projects were similar in design and location to earlier power plants built by the same developer. On the other hand, a major source of delay in approving the application for the project in Blythe was the failure of the developer to provide the energy commission with complete and timely project data. For example, the developer did not provide an interconnection study when it was required. The study is required to determine how the project will affect the electric transmission system. The energy commission's approval timeline requires the interconnection study within 100 days after the application is deemed complete, but the developer had still not provided the study more than 600 days after the scheduled date.

Changes in the design or location of the proposed power plant can also slow the approval process. One example from the applications we reviewed is the San Francisco Electric Reliability Project. The energy commission needed 895 days to approve this project, 530 days longer than its 365-day timeline. The energy commission received the original application for that project on March 18, 2004, and determined that it was complete on April 21, 2004. However, on November 4, 2004, the developer requested that the application be put on hold to assess an alternate site. It then submitted an amended

The energy commission took, on average, 674 days to approve the 15 applications we reviewed.

application on March 25, 2005, that entailed a change to a new site a quarter mile away. The application was further amended on November 18, 2005, to incorporate a revised storm-water drainage plan. Finally, the energy commission received a third amendment to the application on December 20, 2005, to address a change in the water supply source and a new water pipeline route. These design changes resulted in several rounds of public notices, their corresponding waiting periods, and responses.

The energy commission has stated that the process for approving applications for solar thermal power plants is the same as that for natural gas-fired plants. It also stated, however, that there may be significant differences between the applications because of their different plant locations, transmission line locations, amounts of land required, and amounts of pollution produced. For example, according to the energy commission, one obstacle in the approval process for a natural gas-fired power plant is the pollution it can produce. In contrast, solar thermal power plants do not face that obstacle because they generate significantly lower levels of emissions when compared to power plants that use fossil fuel. However, some factors affecting natural gas-fired thermal power plants, such as facility design and site-specific characteristics, may also cause delays in approvals of new large solar projects.

Transmission Line Projects Can Face Significant Opposition From Owners of the Land They Cross

Resources for renewable energy are often located in remote areas, far from the consumers of the energy they will produce. To transmit energy from a remote power plant, new or upgraded transmission lines may be necessary. However, affected parties such as public agencies can oppose the project, resulting in extensions to the utilities commission's 12-month review process for approving transmission lines.

Since 2004 the utilities commission has approved seven applications for transmission projects for investor-owned utilities. We evaluated three applications that were for transmission lines. From the date the utilities commission deemed the applications complete to the date it made its final decisions, the process took an average of 552 days. While two of the three transmission line applications were for projects related to electricity from renewable sources, none were for solar projects. Although the application processes are the same for transmission projects for electricity generated from renewable and nonrenewable sources, the utilities commission took an average of 105 days longer to process the applications for transmission lines related to renewable energy than it did for transmission lines related to nonrenewable energy.

From the date the utilities commission deemed the applications complete to the date it made its final decisions, the process took an average of 552 days.

Because of the limited number of applications available for our review, and because each transmission project is unique, we did not draw conclusions as to why the approval of transmission lines related to renewable energy took longer. However, we reviewed the transmission line project with the longest review period—a transmission line related to renewable energy—and observed that delays were in part the result of a federal agency not completing its review within the utility commission’s time frame and opposition from a jurisdiction through which the transmission lines passed. In total, approval of the project took 694 days. Approval was slowed by the U.S. Forest Service’s review of the proposed route through the Angeles National Forest. Because of large project caseloads and the need for a complete environmental review, the U.S. Forest Service was unable to meet the deadlines set by the utilities commission. In addition, the city of Santa Clarita proposed an alternative route that did not cross the city or the Santa Clarita Valley, which required additional consideration by the utilities commission and delayed the release of the environmental impact report.

System Operators Are Responsible for Approving Interconnections to the Power Grid

Since the CAISO began processing requests to interconnect to the power grid, the average time necessary to obtain approval has exceeded its timeline by about six months. According to its director of state affairs, the CAISO formally took over management of the interconnection process in May 2006, when the Federal Energy Regulatory Commission approved its large-generator interconnection procedure. The director of state affairs also stated that before then, investor-owned utilities were responsible for negotiating agreements with power plant operators to connect power plants to the power grid.

Based on timelines in the CAISO’s documentation and discussions with the agency, we determined that if an interconnection request encounters no delays, it should take roughly two years to complete. To evaluate this process, we examined the 10 agreements for new power plants finalized between the CAISO, developers, and investor-owned utilities since May 2006 and determined that the agreements took an average of about two and one-half years to complete. However, because it has yet to manage an interconnection request from start to finish, it is not yet clear how long the CAISO will take. As a result, it is also unclear what effect the agency’s administration of the interconnection process will have on a project’s ability to start generating electricity. Previously, each investor-owned utility maintained its own interconnection queue. These interconnection requests were consolidated by CAISO into a single queue, and it subsequently took

We determined that 10 interconnection agreements finalized since May 2006 took an average of about two and one-half years to complete, instead of the two years CAISO documentation indicates it should take.

over the interconnection process. It should be noted that as of September 2007 the CAISO had 206 active requests in its interconnection queue.

Concurrent Applications Can Reduce the Time Necessary for Approval

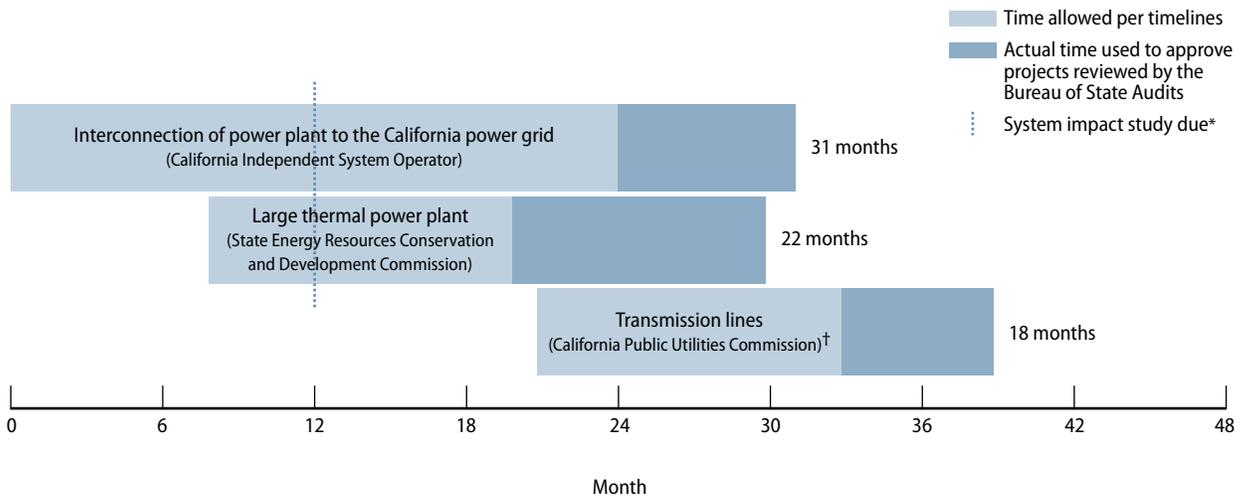
Our analysis of each of the approval processes for a large solar power plant provides not only an indication of how long each process might take but also how long all processes together might take. As previously described, each approval process varies in length, depending on factors unique to each application. Although the average amount of time necessary to obtain each of the approvals we identified exceeded the respective agency's timelines, applications for solar power may differ significantly from those we reviewed, and no applications for large solar power plants have been recently approved.

Further, because some of the required approvals may be obtained concurrently, a delay in obtaining one approval may not delay obtaining others. However, as indicated in Figure 7, even with an overlap of the processes, it could take about 39 months to obtain approvals from the energy commission, the CAISO, and the utilities commission for a single solar power plant and its related transmission lines.

Each of the approval processes we reviewed has a distinct role. Further, the protections provided by each process exist to accomplish certain goals. For instance, the energy commission's process for approving new power plants is a part of the State's goal to protect environmental quality, as well as to ensure a reliable, affordable, diverse, safe, and environmentally acceptable supply of electricity. Part of the mission of the utilities commission, which issues certificates of public convenience and necessity for new and upgraded transmission lines for investor-owned utilities, is to protect consumers by ensuring the provision of safe and reliable utility infrastructure at a reasonable cost. The mission of the CAISO, which reviews requests to interconnect to the power grid, includes ensuring that the power grid is operated reliably and efficiently. Local governments' general plan and zoning requirements provide cities and counties with flexibility in specifying the appropriate use of their land. Government agency fulfillment of environmental requirements is intended to ensure that the environmental impacts of projects are considered, and more specifically, the Legislature enacted the CEQA as a system of checks and balances for land use development and management decisions in California. But without actual approved applications for large solar power plants and their related transmission lines to

examine, we did not determine if the costs of the approval processes used to help meet these goals outweigh the benefits they provide, and what aspects of the processes might be unnecessary.

Figure 7
Number of Months Needed to Approve Applications Related to New Power Plants



Sources: Information provided by the California Independent System Operator (CAISO), the State Energy Resources Conservation and Development Commission (energy commission), and the California Public Utilities Commission (utilities commission).

* Both the CAISO and the energy commission require the completion of a system impact study as part of their approval processes. For purposes of this graphic, we aligned the approval processes at the point when each agency's timeline shows a completed system impact study. The CAISO's timeline shows this study occurring about a year after the start of its approval process. The energy commission's timeline shows this study occurring at 100 days.

† An application for a certificate of public convenience and necessity from the utilities commission may be initiated concurrently with other approvals. However, the utilities commission cannot issue this certificate until the developer obtains approval for the power plant from the energy commission. Because of the absence of a more detailed requirement defining how the two timelines relate to each other, we placed the midpoint of the utilities commission's timeline at the end of the energy commission's timeline to indicate how the two might overlap. Further, according to staff of the CAISO, the energy commission, and the utilities commission, a power plant can begin providing power at a reduced capacity over the existing infrastructure until the necessary upgrades to transmit power at full capacity are completed.

We conducted this review under the authority vested in the California State Auditor by Section 8543 et seq. of the California Government Code and according to generally accepted government auditing standards. We limited our review to those areas specified in the audit scope section of the report.

Respectfully submitted,



ELAINE M. HOWLE
State Auditor

Date: January 24, 2008

Staff: Dale A. Carlson, MPA, CGFM, Project Manager
Jonnathon D. Kline
Aaron Fellner
Crystal Labarinto
Richard J. Lewis, MBA

For questions regarding the contents of this report, please contact Margarita Fernández, Chief of Public Affairs, at (916) 445-0255.

(Agency response provided as text only.)

California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

January 10, 2008

Elaine M. Howle*
State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Dear Ms. Howle:

The California Energy Commission appreciates the opportunity to provide comments on the draft report titled, "Solar Energy: As the Cost of This Resource Becomes More Competitive With Other Renewable Resources, Applications to Construct New Power Plants Should Increase."

First, we would like to express appreciation for the constructive and cooperative approach taken by your staff in the many meetings with Energy Commission staff. We believe this facilitated an effective dialogue and exchange of information between our two staffs. Second, we would like to offer comments that provide additional contextual information we believe will help the Legislature and other readers of your report better understand power plant and transmission permitting in California, including the permitting of solar facilities. We understand that some of these comments may be beyond the scope of the audit, but nonetheless believe they are relevant to the issues addressed in the report. We recognize the importance of ensuring timely siting of solar and other renewable power plant projects in meeting the state's Renewable Portfolio Standard.

We think it is important that you identify the 15 projects the Energy Commission sited from 2002 to 2006 that were reviewed as part of the audit and the basis for selecting this group of facilities. We note that in the prior audit performed by the Bureau of Audits on the Energy Commission's siting program in 2001 that you supplied a table showing the projects included in the audit. This information is critical to understanding the reasons for the amount of time needed to process these 15 projects and in identifying the other circumstances that resulted in delay in the project schedules. ①

We agree with your statement in the audit that "factors outside of the energy commission's control, such as developers failing to provide required information in a timely manner or making changes to the site or design" are the primary causes of delays in project schedules. It is important that the Energy Commission be in a position to explain, if asked, why the average time needed to process these 15 applications exceeded 12 months. As a point of reference, in the prior audit of our siting process the State Auditor found that "the average approval time for applications over the past 11 years was 14 months." The 2001 audit also found that "the energy commission is able to approve projects quicker than other permitting processes in California because it combines activities that are performed consecutively under other processes." We believe this statement is still true. ②

* California State Auditor's comments appear on page 41.

Ms. Elaine Howle
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The electricity industry has undergone major changes between 2001 when the first audit was conducted and today, which has had an impact on the time taken to process the applications. Prior to 2001, the great majority of power plants were constructed by utilities to serve their customers or were cogeneration projects with standard offer contracts. After the 2000-2001 energy crisis, the majority of power plants are owned and operated by Merchant Generators who sell electricity via power purchase contracts. Financial institutions have generally declined to finance a project that lacks a power purchase contract. Consequently, project developers without a contract have often not vigorously pursued trying to obtain a license/approval in 12 months after filing their applications, since the project was not going to proceed to construction without a contract. As a result, the Commission's requests for information from project developers frequently languished since there was no sense of urgency on the part of the applicant. Despite this, between 2001 and today, 63 projects totaling 23,946 megawatts (MW) of new power plants have been approved by the Energy Commission. Of that, 13 projects totalling 7,240 MW has not been constructed due to lack of power purchase contracts.

The audit notes that of the 15 projects reviewed, Blythe II took the longest to review, 1246 days. While perhaps outside the scope of the audit, we believe it is informative to mention the fact that Blythe I, a nearly identical project previously approved by the Energy Commission and adjacent to Blythe II, was certified in 364 days. The difference in review time between the two projects was basically the result of the Blythe II applicant not having a clear transmission path over which to deliver their electricity to the Southern California load centers. It took nearly two years, not a few months, for the applicant to submit an approved transmission interconnection study. While we do not object to including Blythe II in your survey, we believe everyone who reads the audit report needs to understand that a few projects with siting issues outside of the control of the Energy Commission can significantly skew the average time it takes to process a power plant application. A more representative number may have been the median review time for the 15 projects, versus an average, given the unique circumstances of a small number of projects like Blythe II.

③

Finally, we would note that siting major energy infrastructure in California, whether power plants or transmission lines, is complex and difficult, as your audit notes. To do so in 12 months is a significant accomplishment, particularly where there is often significant local opposition to projects, and because the high value we place on protecting public health and environmental quality often requires developing mitigation measures beyond those proposed by project proponents. The Energy Commission remains committed to working with project applicants, interested governmental agencies, other stakeholders, and the public to ensure that applications are processed in as timely a manner as feasible while at the same time ensuring an open and transparent licensing process.

Thank you again for the opportunity to provide comments on the audit report. Please contact Terrence O'Brien, Deputy Director Energy Facilities Siting Division, at 916 654-3933 if you have any questions.

Sincerely

(Signed by: Melissa Jones)

MELISSA JONES
Executive Director

Comments

CALIFORNIA STATE AUDITOR'S COMMENTS ON THE RESPONSE FROM THE STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

To provide clarity and perspective, we are commenting on the response to our audit report from the State Energy Resources Conservation and Development Commission (energy commission). The numbers below correspond with the numbers we have placed in the margin of the energy commission's response.

We do not believe that a table identifying the 15 nonsolar projects we reviewed is necessary, as none are solar projects, which are the focus of the audit; we provided the information regarding large thermal power plants using nonsolar fuels only for comparative purposes.

①

The energy commission's statement is overly broad. On page 32 we noted several factors that caused delays in approving the two applications we reviewed in more detail. Because the number of applications we reviewed was small, we did not conclude, as the energy commission asserts, that these factors generally are the primary causes of delays in project schedules. We revised the text on page 32 to more clearly limit the extent of our conclusion from this review.

②

The average number of days necessary to approve the 15 projects we reviewed and the median are very similar—674 days for the average and 664 days for the median. Because there is little difference between these two measures, we believe our use of the average is appropriate.

③

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(Agency response provided as text only.)

Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102-3298

January 10, 2008

Elaine M. Howle*
State Auditor
Bureau of State Audits
555 Capitol Mall, Suite 300
Sacramento, CA 95814

Re: CPUC Comments on Solar Energy Audit

Dear Ms. Howle:

Thank you for the opportunity to respond to the draft audit on Solar Energy. We found the audit report to be thorough and well written, and appreciate the inclusive process by which you carried out the audit. As the audit report makes no recommendations, our response, below, is limited to: (1) providing information on additional processes currently under way which may facilitate the interconnection of new solar (and other renewable) projects to the grid, and which the Bureau may wish to consider referencing in the audit; and (2) suggesting certain clarifying information.

ADDITIONAL INFORMATION

1. Renewable Energy Transmission Initiative (RETI)

①

The Renewable Energy Transmission Initiative (RETI) was launched to address the long-run challenge of developing California's renewable resources and transmission infrastructure in the most timely and cost-effective way. Nearly all of the bids into the IOUs' 2007 RPS solicitations were for "new steel in the ground." While the number of contracts signed and approved by the CPUC and the growing participation in RPS solicitations indicate that the RPS procurement mechanism is working, many projects require upgrades to the transmission network in order to come online.

Proactive renewable transmission planning requires "big picture" judgment and coordination between transmission development and resource/procurement planning. RETI thus brings together the CPUC, Energy Commission, California ISO, IOUs, municipal utilities and other stakeholders in a three-phased planning process.

Phase 1 of RETI consists of a thorough economic evaluation of the state's developable renewable potential and an identification of those areas - Competitive Renewable Energy Zones (CREZs) - that hold the greatest potential for cost-effective renewable development. These CREZs will be ranked according to their value to the state, and Phase 2 will develop conceptual transmission plans to access the highest-ranked CREZs. Stakeholder involvement early in these processes will, among other things, help to refine a thorough cost-effectiveness analysis and identify "show-stoppers" and hurdles with regards to project and transmission

* California State Auditor's comments begin on page 47.

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siting and permitting. Phase 3 will involve detailed analysis of specific transmission plans, the ultimate outcome being the filing of one or more Certificates of Public Convenience and Necessity at the CPUC for permission to construct the final transmission project(s).

RETI was launched on September 20, 2007 with the first meetings of the RETI Stakeholder Steering Committee and Plenary Stakeholder Group. More information about RETI, including presentations from the September 20 meeting and a Mission Statement detailing RETI's process and administrative structure, is available on the RETI website, <http://www.energy.ca.gov/reti/index.html>.

② 2. Interconnection Queue Reform

At the prompting of CPUC staff, the California ISO, the CPUC and other stakeholders are collaborating on a proposal for FERC consideration that would allow the ISO to reform its Large Generator Interconnection Protocols (LGIP), and potentially expedite the interconnection of thousands of MW of renewable capacity. Details about the proposal are available in presentations prepared for a FERC technical conference and a Joint Agency Energy Action Plan Meeting in December 2007. In short, the proposal aims to address many of the current LGIP problems by allowing the ISO to geographically cluster current and future projects in the queue and study joint transmission solutions for those clusters; to weed out speculative projects by requiring a more stringent showing of project viability; to prioritize interconnection requests based on RPS goals, procurement milestones and transmission cost-effectiveness; and to assign cost responsibility to generators on a pro rata basis.

The ISO has established a schedule for stakeholder input into the reform proposal and expects to submit the final proposal to FERC this coming March. LGIP reform is critical to meeting California's RPS goals, and the CPUC looks forward to continued collaboration on this effort.

CLARIFYING INFORMATION

- ③ 1. Page 4 – we suggest that the timeline be framed in terms of months rather than days, because we typically refer to months instead of days for the environmental reports. Thus, we would suggest changing the reference to 12 and 18 months, respectively, rather than 365 and 552 days.
- ④ 2. Page 7, second paragraph, line 3 – we suggest that the phrase “one of the State’s power grid managers” be changed to read, “the State’s largest power grid manager.” The ISO is the largest power grid manager in the state. Most other power grid managers in the state are municipalities which are much smaller than the ISO.
- ⑤ 3. Page 37, first paragraph, line 10 – we suggest clarifying the sentence that reads, “According to a program and project supervisor at the utilities commission, the certificate [of public convenience and necessity] indicates that the line will provide increased reliability, meet an economic need or facilitate goals related to renewable power,” to read instead “According to the utilities commission a CPCN may be granted where the line will provide increased reliability, be justified on economic grounds such as providing access to lower cost power, or facilitate goals related to renewable power.”

Elaine M. Howle
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Page 3

4. Page 38, top paragraph, last sentence – we suggest clarifying the sentence that reads, “However, the program and project supervisor indicated that the utilities commission generally works collaboratively with federal agencies to conduct a joint environmental process,” to read instead, “In such cases, the utilities commission generally enters into a Memorandum of Understanding with the relevant federal agency (usually BLM or the U.S. Forest Service) to collaboratively conduct a joint environmental process.” (5)

5. Page 38, first full paragraph, last sentence – we suggest clarifying the sentence to read, “In a case where an IOU requires a CPCN for a project which is undergoing environmental review at another state agency (e.g. where the utility will own the generation intertie which connects a third party solar thermal project to the transmission grid, the energy commission undertakes the environmental review for both the solar thermal project and the intertie; the IOU’s ownership of the intertie requires the utility to obtain a CPCN from the utilities commission), although state law allows the submission of applications to the utilities commission concurrently with applications to other agencies, it forbids the utilities commission from approving projects until the application for the power plant receives approval from the energy commission.” (6)

Alternatively, the Bureau may wish to consider modifying this paragraph to reflect the fact that the energy commission may undertake environmental review of a developer’s solar thermal generation project concurrently with the utilities commission’s environmental review of a network transmission project that would facilitate the delivery of energy from such a generation project. Indeed, one of the goals of the RETI process described above is to promote the development of renewable generation and the transmission needed to deliver it on similar time lines, so that one does not lag the other.

6. Page 43, second paragraph, last sentence - we suggest clarifying the final sentence to read, “In addition, although the utilities commission proactively contacted other agencies, including the City of Santa Clarita, very early during the CEQA/NEPA process, the City of Santa Clarita provided comments to the utilities commission very late in the process which proposed a new alternate route which would not cross the city or the Santa Clarita Valley. The late proposal of the new alternate route required consideration by the utilities commission and delayed release of the environmental impact report.” (7)

We look forward to seeing the final report.

Sincerely,

(Signed by: Sid Quan for)

Paul Clanon
Executive Director
California Public Utilities Commission

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Comments

CALIFORNIA STATE AUDITOR'S COMMENTS ON THE RESPONSE FROM THE CALIFORNIA PUBLIC UTILITIES COMMISSION

To provide clarity and perspective, we are commenting on the response to our audit report from the California Public Utilities Commission (utilities commission). The numbers below correspond with the numbers we have placed in the margin of the utilities commission's response.

We appreciate the utilities commissions' information regarding the Renewable Energy Transmission Initiative and its goals. However, we did not include in our report information related to this initiative because, as of the close of our fieldwork in December 2007, its coordinating committee had not proposed changes to the existing approval processes that we could review or evaluate.

①

Based on information obtained from the California Independent System Operator, we included information about recent actions related to the interconnection process on page 21 of our report.

②

While preparing our draft report for publication, page numbers shifted. Therefore the page numbers that the utilities commission cites in its response do not correspond to the page numbers in our final report.

③

On pages 13 and 29 of our report, we state that the CAISO controls 75 percent of California's power grid. We do not believe that adding this information to the page cited by the utilities commission is necessary. (Section 8545 of California's Government Code prohibits the Bureau of State Audits from disclosing information before an audit is completed. Because we redacted information related to other agencies we audited from the draft audit report we distributed for its review, the utilities commission did not have this information.)

④

We amended our report to reflect these statements by the executive director of the utilities commission. The executive director's statements slightly revised earlier statements provided to the audit team by a program and project supervisor at the utilities commission.

⑤

We amended slightly the text on page 31 of our report based on this comment. However, we did not fully include the executive director's proposed change because the language is too technical in nature and it did not affect the accuracy of the report.

⑥

- ⑦ While we appreciate the utilities commission's suggestion, we do not believe additional details related to the city of Santa Clarita are necessary for our report. Documentation provided by the utilities commission indicates that the time taken by the U.S. Forest Service to review the draft environmental report was a larger contributor to the delay in approving this project.

cc: Members of the Legislature
Office of the Lieutenant Governor
Milton Marks Commission on California State
Government Organization and Economy
Department of Finance
Attorney General
State Controller
State Treasurer
Legislative Analyst
Senate Office of Research
California Research Bureau
Capitol Press