BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies, Procedures and Incentives for Distributed Generation and Distributed Energy Resources.	Rulemaking 04-03-017 (Filed March 16, 2004)

ASSIGNED COMMISSIONER AND ADMINISTRATIVE LAW JUDGE'S RULING SEEKING COMMENT ON STAFF SOLAR REPORT

The Governor and Senate Bill 1 have proposed to promote residential and commercial solar installations in California and have stated a goal to install one million solar systems or an equivalent of 3,000 megawatts of solar capacity by 2017. These objectives complement those of this Commission and the California Energy Commission (CEC) to improve electric system reliability and reduce greenhouse gas emissions.

To explore ways to promote an expanded solar program, the Commission issued two rulings in this proceeding soliciting ideas regarding program design, funding levels and sources, and an implementation schedule. The Commission directed CPUC and CEC staff to "draft a joint report to the Commission on all related issues that will take into account the parties' comments."

The CPUC and CEC staff has developed an analysis of key issues related to implementing what the staff is calling the California Solar Initiative (CSI). In summary, their report proposes to consolidate existing and anticipated residential and commercial solar incentives into one program by June 2006. Eligible technologies would include photovoltaics and concentrated solar power

up to 1 Megawatt, and solar water heaters. The report proposes that initially, Pacific Gas and Electric Company, Southern California Edison Company, and Southern California Gas Company, and the San Diego Regional Energy Office (SDREO) would administer the CSI. The program would be funded through 2016 using gas and electric distribution rates. Tariff and metering requirements would be coordinated with the CPUC's demand response and distributed generation proceedings.

This ruling solicits the parties' comments on the staff's report, attached to this ruling. After receiving those comments, the assigned Administrative Law Judge will work with the assigned Commissioner to draft a proposed decision for the full Commission's consideration.

IT IS RULED that the parties to this proceeding may comment on the attached staff report proposing ways to implement the California Solar Initiative. Opening comments must be filed no later than July 1, 2005. Reply comments must be filed no later than July 14, 2005.

Dated June 14, 2005, at San Francisco, California.

/s/ Michael R. Peevey	Kim Malcolm
Michael R. Peevey	Kim Malcolm
Assigned Commissioner	Administrative Law Judge

Attachment 1

California Energy Commission Renewable Energy Program
California Public Utilities Commission Energy Division

Joint Staff Recommendations To Implement
Governor Schwarzenegger's One Million Solar Roofs Program

June 14, 2005

CPUC AND CEC JOINT STAFF PROPOSAL TO IMPLEMENT A CALIFORNIA SOLAR INITIATIVE

Introduction and Purpose

Governor Schwarzenegger and legislators propose various mechanisms to aggressively promote residential and commercial solar installations in California. The Governor's proposal and Senate Bill 1 seek to install one million solar systems or an equivalent of 3,000 megawatts of solar capacity, by 2017.

To explore ways to promote the Governor's objectives, two assigned commissioner rulings issued in Rulemaking (R) 04-03-017 on November 29, 2004 and March 7, 2005 respectively, solicited ideas regarding program design, funding levels and sources, and an implementation schedule; and requested CPUC and CEC staff to "draft a joint report to the Commission on all related issues that will take into account the parties' comments."

The CPUC and CEC staff (Joint Staff) developed an analysis of key issues related to implementing what we call the California Solar Initiative (CSI). We propose to:

- consolidate residential and commercial solar incentives into one program, a "one-stop-solar-shop," by June 2006.
- include photovoltaics, solar-thermal electric, and solar hot water heaters as eligible technologies, installed to offset customer load on site.
- initially continue a size limit on incentives for electricity-generating installations of up to 1 MW.
- Initially continue and consolidate day-to-day administration of the program through Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), Southern California Gas Company (SoCalGas), and the San Diego Regional Energy Office (SDREO).

- Fund the program through 2016 via gas and electric distribution rates. Tariff and metering requirements will be coordinated with the CPUC's demand response and distributed generation proceedings.

We also encourage publicly-owned utility districts (PUDs) to develop a similar program for non-IOU customers and to coordinate their efforts with our proposed program to create a statewide program, as much as possible.

Program Rationale

California is in the midst of planning for future economic, energy and environmental needs. Economists forecast robust growth over the next ten years, growth in population, business development, and housing. Along with welcome economic growth comes the need for expanded transportation, education, and energy infrastructure. Multiple planning efforts are underway to assess the magnitude and the potential impacts associated with our infrastructure needs.

The CPUC and CEC work in collaboration and in tandem to ensure California's energy supply is safe, reliable, and reasonably priced. In the aftermath of the energy crisis, the agencies adopted aggressive energy efficiency standards and renewable procurement goals to reduce peak demand and harmful environmental impacts associated with conventional energy generation. Most recently, the Governor announced his intent to address greenhouse gas emissions (GHG) and climate change issues. To that end, the CPUC requires the energy utilities to assess the financial risk associated with GHG emissions, and is looking at options to establish a GHG emissions reduction target for energy utilities.

The agencies are also in the midst of a proceeding to develop a common cost-benefit methodology for use in utility resource planning and procurement, and to determine incentives for procurement resources. This proceeding will

help to quantify the costs and benefits of distributed solar energy systems in the state. As the costs and benefits of solar are quantified, we will incorporate the determined value in our CSI program design.

Of all commercially available distributed generation technologies, photovoltaic and concentrated solar systems have the greatest technical potential but also the highest cost. After eight years and close to $1 billion of subsidies, installed solar costs in California have decreased only slightly, and the industry has made little progress in reaching a self-sustaining market. California policies are clearly supportive of the on-grid solar market, but that support was unevenly distributed and often unavailable.

Objectives

This program is being proposed to contribute to the environmental goals articulated by Governor Schwarzenegger and the Joint Agencies in many forums, namely: to significantly increase the amount of renewable generation and distributed generation in California and thereby decrease GHG emissions, improve air quality, and diversify California's energy portfolio. The objectives of the program are to:

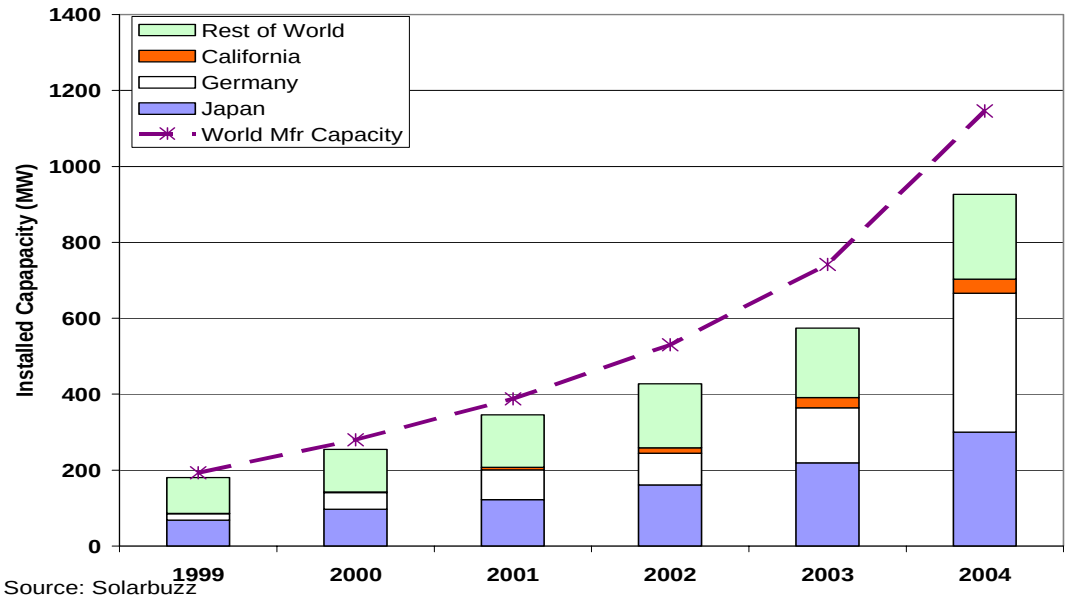
- Add clean, distributed contribution to our peak demand resources.
- Reduce risk by diversifying California's energy portfolio.
- Lower the burden of expanding and maintaining the State's transmission, pipeline, and distribution systems for electricity and natural gas.
- Demonstrate a long-term commitment to solar energy.
- Establish a program plan under which solar products and providers can transition to a market without incentives.

- Include protocols to allow residents of affordable housing to utilize solar technologies they might not otherwise be able to access.

Local Actions Impact Global Solar Cost and Supply

California was an early adopter of solar technologies, supporting widespread solar installations through a combination of favorable rates, rules, and financial incentives. California is the third largest PV market in the world but is relatively small in comparison to Japan and Germany. In addition, other US states, and many countries are increasing their support and installation of solar generation. California installed about 36 MW in 2004 compared to over 900 MW worldwide. Figure 1 shows the annual installed capacity for the three largest programs and the rest of the world in the last six years. The dashed line represents the annual manufacturing capacity of PV modules at the end of each year. While it would appear that manufacturing capacity is increasingly in surplus, in fact installations grew so rapidly during 2004 that capacity was strained during the year, leading to widespread reports of module shortages in California.

Figure 1 – Annual Installed PV Capacity and Manufacturing Capacity



Source: Solarbuzz

Given the current size and future growth potential of the California solar market, solar incentive policy development must now consider a broad number of factors, including worldwide solar market conditions. Solar policy decisions made in Germany, Japan, and the rest of the world impact global solar costs, supply, and availability, and hence have impacts on California's proposed CSI program. For example, incentive policies in Germany created high demand for PV systems in a very short period, leading to the current supply and demand imbalance, and to increased equipment prices worldwide. In contrast, Japan has successfully grown its PV market gradually over the past decade with minimal market disruptions. Spain recently adopted a program similar to the German model, with mixed results.

The following three sections discuss key elements of each region's solar program below.

California's Solar Incentive Programs Today

California currently has two legislatively-mandated solar incentive programs funded through investor-owned utility rates, which are summarized below, and described in greater detail in Appendix A.[1]

The Emerging Renewable Program (ERP)

The ERP provides incentives to encourage and support emerging technologies. The majority of fund recipients are small solar projects. The ERP is funded through the Public Goods Charge (PGC) created by Assembly Bill (AB) 1890[2]. CEC staff receives and processes all program applications (with some contractor assistance), and authorizes individual rebate amounts. Rebates are based on installed capacity; current rebates for most solar PV installations are $2.80 per watt (affordable housing installations receive a higher incentive and self-installed installations a lower incentive). Since 1998, the ERP has allocated $371 million, mostly for residential incentives. To date, the ERP has installed over 50MW of solar projects. Earlier this year, the CEC initiated a pilot performance-based incentive program which pays per-kWh incentives based on the amount of electricity generated by the system over three years rather than initial installed system capacity.

The Self Generation Incentive Program (SGIP)

The SGIP was adopted by the CPUC to fulfill the requirements of AB 970, which directed the CPUC to provide "differential incentives for renewable or super clean distributed generation." Since 2001, the SGIP either paid or reserved

[1] The Los Angeles Department of Water and Power, the Sacramento Municipal Utility District, and other publicly-owned utilities also administer solar incentive programs for their customers.

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[2] Continued by SB 1194 and AB 995.

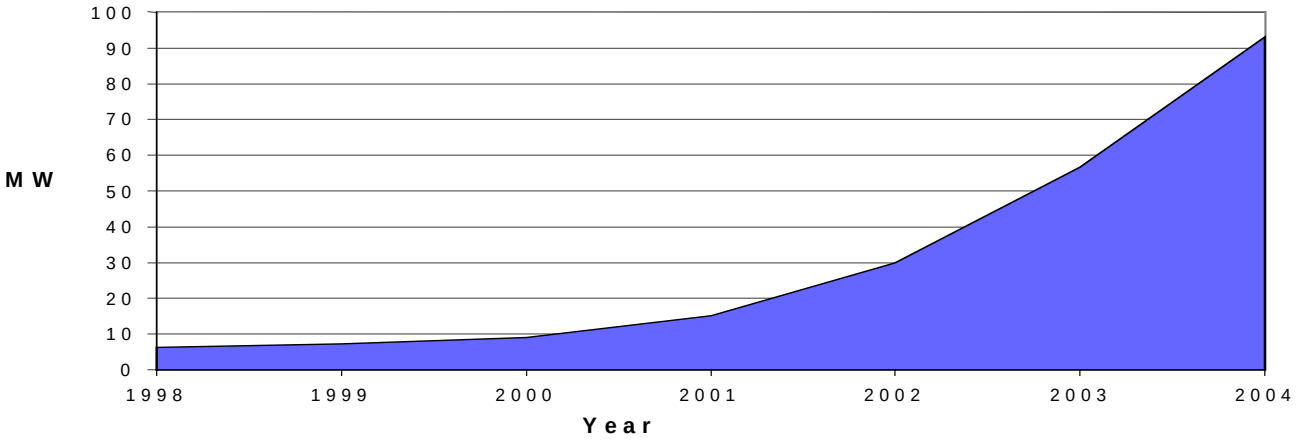
rebates up to $581 million for renewable and clean projects totalling 318 MW. Solar projects account for 113 MW, for rebates totaling $421 million. Current solar rebates are $3.50 / watt, scheduled to drop to $3.00 / watt January 1, 2006.

Several actions taken to resolve the electricity crisis spurred solar installations after 2001.

- The new CPUC SGIP program expanded funding available for incentives to large PV projects (above 30 kW), allowing the ERP to concentrate on smaller projects.
- The Legislature expanded net energy metering rules to allow systems from 10 kW to 1 MW to participate.
- ERP participation increased as the tiered electricity rate structure implemented in 2001 raised rates for residential customers whose energy use is above baseline quantities, which improved the economic viability of residential PV systems.
- The Legislature approved a 15 percent state tax credit for systems installed in 2001 through 2003 and 7.5 percent for systems installed in 2004 and 2005.

Figure 2 illustrates the growth of the California solar market from 1998 through 2004.

Figure 2: Grid-Connected PV Capacity Installed in California 1998-2004



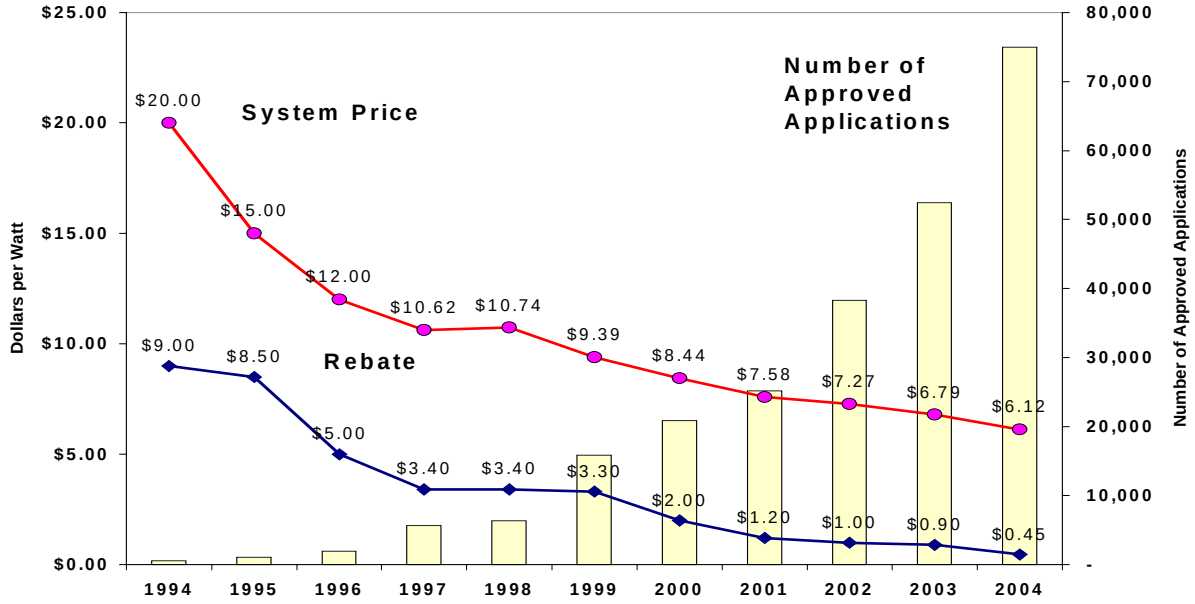
Japan's Solar Incentives Focus On the Residential Market

In 1994, Japan initiated a federal-level solar rebate program, providing incentives of $9.00 per Watt. Average system prices were about $20.00 per Watt. The rebates declined annually over the next ten years; the 2004 rebate was about $0.45 per Watt. The program has grown to approve over 70,000 applications in 2004, which added about 300 MW of solar capacity in that year.

Figure 3 shows the average system price, rebate level and number of applications since 1994.

Figure 3 – Japanese Program Rebates and Participation

1994-2004



Participation increased gradually, system prices in Japan declined substantially, and the net cost to the customer remained about the same. Today, the average installed system price is $6.12 / watt.

In 2006, federal rebates in Japan are scheduled to sunset, although some local governments and entities will continue to support projects with local incentives. The significance of the local incentives is not clear at this time. Annual federal program funding peaked at about $250 million in 1999, and is currently declining with the level of incentives, even with increased applications, and has exceeded $150 million in four out of eleven years. The eleven-year program budget exceeds one and a half billion dollars.

Germany Utilizes Performance-Based Incentives

The electric utilities administer Germany's solar incentive program. Incentives are based on actual energy produced over a 20- year period, paid through a utility "feed-in" tariff, similar to a long-term electricity sales

agreement. The program initially provided low-interest loans, available at the applicant's bank of choice, and administered through the German Reconstruction Loan Corporation.

Like California, Germany seeks to reduce CO2 emissions.[3] To that end, policymakers reinvigorated the solar program, now called 1,000,000 Solar Roofs. The government increased the feed-in tariffs, removed restrictions on system size, and removed participation caps in January 2004. Per kilowatthour (kWh) purchase prices vary by customer class, system size, and physical configuration. Prices for roof-mounted PV range from $0.70/kWh for residential customers to $0.55/kWh.for large commercial installations.[4] Building-integrated systems receive an additional $0.06 /kWh bonus. The purchase price for solar kWh is scheduled to decline by 5% per year. Germany has no current plans to alter the feed-in tariff, but terminated the low-cost loans in 2004.

Average residential system prices are about $6.40 per Watt. The program installed 570MW between 1999 and 2004, at a cost to date for the purchased electricity of over $1 billion. About 75% of the systems were installed in the 2004, due to the increased feed-in tariff.

PV Incentives In Spain

Spain's solar program is similar to the German model. It utilizes feed-in tariff for PV, and a separate low-interest loan program. Solar projects receive a guaranteed payment over 25 years of about $0.49.5/kWh for systems up to 100

[3] California proposes to reduce greenhouse gas (GHG) emissions to year 2000 levels by 2010; to 1990 levels by 2020; and to 80 percent below 1990 levels by 2050. Germany's goal is to reduce emissions to 40 percent of their 1990 values until the year 2020.

[4]

kW, and about $0.30 per kWh for capacity sizes over 100kW. There is no cap on the number of systems that may take service on tariff. Loans are limited, which impacts program participation. When loan funding ends, applicants tend to wait for the next round of funding, even though the feed-in tariff alone makes a system purchase economical.

California Solar Initiative

In comments to President Peevey's ruling, three themes emerge:

- Ratepayers may receive more benefit from programs already determined to be cost effective, such as energy efficiency, other distributed generation technologies, or utility-scale renewables.
- Under conditions where incentives are long-term, predictable, and assured, solar energy will become a low-cost option, and the industry self-sustaining.
- The CPUC should determine the costs and benefits of solar attributes to inform incentive policies.

We propose six program elements which consider these themes, capitalize on successful elements of the CEC, CPUC, German, and Japanese solar programs, and provide alternatives to improve identified weaknesses.

1. Consolidate solar incentive programs.
2. Adopt a declining incentive schedule.
3. Establish an energy efficiency eligibility requirement.
4. Provide higher incentives for affordable housing, and for buildings that exceed minimum efficiency standards.
5. Adopt performance-based incentives.
6. Develop a predictable automatic trigger-mechanism to minimize short-term funding gaps, ensure long-term funding availability, and optimize ratepayer funds spent on solar installations.

Projected Benefits

The CPUC hired an independent consultant, Energy and Environmental Economics, Inc. (E3) to assist with development of avoided cost estimates for use in cost-effectiveness evaluations of energy efficiency and demand-side management programs. The CPUC recently approved the avoided cost estimates proposed in the E3 Methodology And Forecast Of Long Term Avoided Costs For The Evaluation Of California Energy Efficiency Programs, and will consider whether these inputs may also be applicable for renewable and distributed generation programs. Our staff report utilizes avoided costs[5] for purposes of estimating Year 1 CSI program benefits, and presents a range of incentive costs based on the next available ERP (2.80 / watt) and SGIP (3.00 / watt) incentive levels.

Item and assumption	Estimate
Estimated average installed capacity per year	300 MW
Summer avoided costs per MWh Peak Partial-peak	 $225 / MWh $78 / MWh
Partial peak avoided cost per winter MWh	$72 / MWh
Average assumed summer operating hours: Peak Partial-peak	 1,325 1,960
Assumed average winter operating hours	1,900
Total MWh savings	450
Total summer benefits (one year)	$ 39 million
Total winter benefits (one year)	$ 12 million
Total annual benefits	$ 51 million
Technology Life (years)	20

[5] E3 report, pp.192-193.

Total benefits over life of units	$1.02 billion

The scenarios contained in this report are proposals only, and will be adjusted to reflect the solar valuation methodology adopted by the CPUC.

Economic Benefits of Federal Tax Credits

Commercial customers may require a better return on investment than a residential customer. Both commercial and residential projects receive state tax credits, but commercial projects also receive federal tax credits (up to 50 percent of net costs) not available to residential customers.

The ERP and SGIP receive applications for systems that are owned and operated by a third-party. This is likely due to the fact that third-party owners of systems installed on homes or public buildings are eligible to take advantage of the federal tax credits.

As shown in the table, tax credits significantly decrease a commercial customer's net cost, as shown in Table 2. However, commercial customers generally face lower rates and different rate structures which are likely to lower the benefit of adding PV. This benefit is further reduced through increased taxes due to lower electricity cost expenses over time. In addition, commercial customers are likely to require a better return on investment than a residential customer. Finally, the tax benefits are reduced, in some cases significantly, for those commercial customers that are not-for-profit or institutional customers, and for those commercial customers whose financial structure does not allow full use of additional tax credits.

Table 2: Impact of State and Federal Tax Credits On Solar Project Costs		
Example Calculation	**Commercial**	**Residential**
System Price	$9.00	$9.00
Rebate	$3.00	$3.00
State Credit (7.5% to end prior to 2006)	*$0.41*	*$0.38*
State Depreciation (~ 6%)	*$0.36*	*$0.00*
Federal Credit (10%)	*$0.60*	*$0.00*
Federal Depreciation (~ 32%)	*$1.94*	*$0.00*
Net Cost to Customer	**$2.69**	**$5.63**
Tax Incentives as Percent of After Rebate Cost	55%	7.5%

CSI Funding Requirements And Allocation

The CSI budget will begin with a simple fund allocation, divided equally between residential (under 10kW) and commercial (over 10kW) projects. We anticipate the Joint Agencies will make program adjustments as necessary to manage funding demand by sector. We estimate CSI total program costs between $1.1 billion and $1.8 billion.

Total program funding is dependent on a number of variables that can change over a ten-year period. While we assume momentum for solar projects will continue once long-term funding is assured, no incentive program can attempt to eliminate all risks to the solar industry, nor guarantee that the industry will be self-sustaining at the end of the program. Our estimates account for known and expected conditions and attempt to forecast the amount of funding that would be required to achieve the proposed 3,000 MW goal, while

phasing out incentives in a manner that result in the most efficient use of ratepayer funds.

By necessity, a larger number of systems will be installed in the program's later years. This approach provides a steady and somewhat predictable growth rate to allow equipment manufacturers to expand capacity and enter into long-term contracts for raw materials and supply of product. It also allows installers, retailers, and system integrators to grow their businesses over the years with minimal funding gaps.

Performance-Based Incentive Model

With an appropriately designed performance-based incentive paid on actual kWh produced, we anticipate commercial sector penetration will be higher than under a capacity-based model. This approach allows commercial projects to further leverage the federal tax credits (worth about 50 percent of the system cost) and reduces incentive program funding needed by over 25 percent to achieve the same economic benefit to the customer. The incentive payments would be implemented by January 2007 for a term of 20 years, based on the completion date of the system. For certain customers, a $0.10 per kWh performance payment would result in a higher economic benefit over 20 years than the current $2.80 ERP rebate on a net present value comparison if other economic benefits, such as net metering and tax credits, remain available.

A performance-based incentive will likely increase program participation for larger projects, because the transaction costs for measuring and reporting performance data for larger projects are lower than for small systems. Per kWh incentives will also encourage optimal system siting and configuration to maximize performance during peak demand periods.

As illustrated in Table 3, this scenario would result in about 750 MW installed on 300,000 new homes, 300 MW on 100,000 existing homes, and another 1950 MW would installed on 19,500 businesses. The total program funding commitment would be about $1.1 billion over the 10-year term of the program.

Table 3: Estimated Solar Installations Required To Achieve 3,000 MW Utilizing Performance-Based Incentives

	Number of Installations	Avg. System Size	Potential MW
New homes	300,000	2.5 KW	750
Existing homes	100,000	3 KW	300
All Commercial	19,500	100 KW	1,950
Total			3,000 MW

Capacity-Based Incentive Model

The capacity-based scenario continues up-front rebates, as offered under the ERP, SGIP, and Japanese programs. We propose to continue this model only until the CSI transitions to performance-based incentives. This scenario incorporates the proposed goal of installing solar projects on 50% of the new home market by 2016. It is the high-cost scenario for commercially-owned projects, because federal tax benefits are not fully optimized.

For illustrative purposes, we calculate residential rebates at $2.80 per Watt. The rebate schedule would decline by $0.28 per year, with installed system prices projected to decline an average of 5 percent per year. Commercial projects would receive incentives between $2.20-$2.80 per watt, and decline $0.20-$0.28 per year. The lower rebate for larger projects still reflects a shorter pay back for commercial customers due to the additional tax benefits and economies of scale, which result in lower installed system costs. We estimate that a capacity-based incentive program, if continued through 2016, would require a $1.8 billion budget over the life of the program.

To achieve the goal to install solar systems on 50% of new homes built by 2016 requires an exponential growth rate of about 55% per year. As shown in Table 4 below, this requires solar installations on 400,000 homes (assuming an average of 2.5 kW per system), for a total of 1,000 MW. We assume that 300,000 existing homes could be retrofitted with systems averaging 3 kW, totaling 900 MW. This reflects a growth rate of about 40% per year. The remaining 1,100 MW would be installed on about 11,000 businesses, averaging 100 kW per system.

Table 4: Estimated Solar Installations Required To Achieve 3,000 MW Utilizing Capacity-Based Incentives

	Number of Installations	Avg. System Size	Potential MW
New homes	400,000	2.5 KW	1,000
Existing homes	300,000	3 KW	900
All Commercial	11,000	100 KW	1,100
Total			3,000 MW

Program Administration

The CSI should take advantage of existing SGIP administrative infrastructure and utilize technical, and safety-related protocols already in place. We propose to retain this basic framework in the CSI's initial start-up phase to ensure a seamless transition from the existing programs to the CSI. These entities already administer a large-scale customer incentive program, and coordinate with other ratepayer-funded energy efficiency, demand response, and educational outreach programs, and facilitate system interconnection and net metering.

In the short-term, PG&E, SCE, SoCalGas, and SDREO would be responsible for day-to-day administration of the CSI in their respective territories. In the future, the agencies may consider alternative third-party

entities in the administrative and/or implementation role. The program administrators will conduct the following activities:

- Coordinate the CSI with energy efficiency program to ensure that the customer maximizes energy efficiency improvements prior to installing a solar system.
- Verify system installation.
- Make payments for installed systems.
- Provide complete information, including application form and directions to apply to the program, on utility and third-party administrator web sites.
- Report on program progress through monthly status reports.
- Conduct annual program evaluations.
- Conduct solar education and outreach, and coordinate CSI marketing with existing statewide and localized efforts, such as Flex Your Power and energy efficiency outreach efforts.
- Make available on their website program status information, including but not limited to current funding levels, system numbers funded and at what levels, and the numbers of systems in the queue.

We also recommend the CPUC retain the statewide Working Group adopted by D.01-03-073, comprised of the Program Administrators and staff from the CEC and the CPUC Energy Division. This group will be responsible for program implementation, developing program forms and procedures, and refining program details. This group should remain an implementation forum only, and is not intended to supplant policymaking authority by the CPUC. The CPUC and the CEC will continue to collaborate on policymaking authority for the joint program. The agencies may also choose to modify the administrative structure in the future.

The CPUC will continue to utilize CEC expertise under the collaborative model established in R.99-10-025 and continued in R.04-03-017, particularly with respect to program planning and design, rate of incentive decline, and recommendations for added incentives for enhanced system configuration.

Preserving Incentive Availability

Both the ERP and SGIP have borrowed funds from future years or transferred funds from other program budget categories to meet excessive demand. Each program has experienced periods when funding was not available. While the goal of this new program is to provide a consistent, long term funding source with minimal incentive disruptions, there may be instances when the prescribed incentive level is too high and demand on program funds exceeds availability.

To minimize funding gaps, the program will allow borrowing forward from future program years, but projects will receive a lower incentive. To ensure optimal funding availability, the program will also utilize a market-based trigger mechanism. For example, if reservation requests exceed 50% of annual funding in the first quarter for either the residential or commercial category, the incentive level for that sector will be reduced ahead of schedule. This mechanism is in addition to the scheduled incentive reduction, and will only be used to align funding with program participation.

Energy Efficiency Requirements

The *Energy Action Plan (EAP)* "loading order" requires optimization of energy efficiency measures first, followed by demand response and renewable energy. Consistent with the EAP loading order, the CEC's *2004 Integrated Energy Policy Report* recommends leveraging energy efficiency improvements in new and existing homes prior to installing a solar system. New residential and

commercial buildings in California are required to meet standards that ensure that a certain level of energy efficiency is attained. These standards are updated periodically to consider new energy efficient technologies, practices and methods. Typically the investor-owned utilities offer financial incentives to encourage customers to install efficiency measures beyond what is required by the building standards.

Neither the ERP nor the SGIP require energy efficiency improvements as a condition of obtaining an incentive for installing a solar system.[6] Projects installed on new structures that exceed energy efficiency standards by 10% or more, should receive an additional 25% rebate. We encourage the Legislature to consider a requirement to make solar installations mandatory on new structures built in fast-growing, high-energy demand regions such as the Central Valley.

Requiring existing commercial and residential buildings to retrofit energy efficiency as a condition for solar rebates is more complex. Residential and commercial buildings vary as to achievable energy efficiency levels, making it more difficult to establish uniform requirements or standards. By October 1, 2005, the CEC is scheduled to report to the Legislature on strategies to reduce energy consumption on existing buildings.[7] These strategies will likely include both mandatory and voluntary measures, and may address benchmarking for existing residential and commercial buildings, reasonable

[6] The ERP requires affordable housing projects to demonstrate above-standard energy efficiency.

[7] The CEC report is required by AB 549.

expectations for cost-effective efficiency levels, and methods to quantify efficiency improvements.

At this time, we do not propose to mandate energy efficiency retrofits as a condition to receive solar incentives. Instead, we recommend the CSI require an existing building constructed more than three years prior to the reservation date to receive an energy audit and submit the results as part of the reservation process for the system. We anticipate the CEC will incorporate the strategies contained in the legislative report into the IEPR, and that the CPUC will consider them at a later date.

Solar Water Heating

In April 2005, the CPUC directed PG&E, SCE, SDG&E, and SoCalGas to include solar water heating in their energy efficiency program proposals for funding years 2006-2008. The utilities filed their proposals with the CPUC June 1, 2005. We recommend the CPUC adopt an appropriate plan to offer an up-front rebate to solar water heaters, payable after system installation, as part of the CSI. We recommend the rebate be based on a system performance index. Rebate levels should decline over a ten-year period.

Time-Based Metering Requirements

The CPUC is considering IOU proposals for advance metering infrastructure (AMI) in a current proceeding. The approval and implementation timeline for these proposals is uncertain, and the CSI must be carefully coordinated with the AMI proceeding to avoid potential duplication, confusion, and contradiction of these efforts. In addition, the AMI proceeding should investigate inclusion of the ability to interact with the installed solar system and other distributed generation metering and monitoring capabilities (often part of

the system inverter), and should identify the potential safety and system operation benefits of coordinating AMI with distributed generation.

In order to implement performance-based incentives for commercial installations, advanced metering will be useful to determine system production on a precise time-of-use basis. We anticipate the CPUC will address AMI prior to the CSI program's conversion from capacity- to performance-based incentives.

System Performance Metering

At a minimum, a customer should be able to determine the amount of energy produced by the solar installation. The meter would not be used for billing purposes, but merely allows the customer to track system performance and make adjustments or repairs as necessary. Many systems already include an inverter with self-contained internal metering and display equipment. The CSI should require systems without this feature to install inexpensive, non-utility-grade performance meters. The CEC develops and maintains a list of acceptable performance meters and inverters with built-in meters for the ERP, and we propose the CPUC adopt the CEC-preferred equipment as an eligibility requirement for the CSI.

Incentives For Affordable Housing

The ERP contains provisions to pay enhanced incentives (currently 25% above the standard incentive, not to exceed 75% of system cost) to qualifying affordable housing projects. We propose initially to continue this practice in the CSI, while conducting a thorough investigation into the specific structure of affordable housing markets in order to modify the program to allow significant additional affordable housing participation. ERP has received applications for almost 350 affordable housing projects. We believe the CSI's long-term assured funding will be attractive to affordable housing developers.

Solar Financing

As discussed above, Spain currently provides access to low-interest financing for solar projects, in cooperation with participating banks. It is likely that the attractive tariff and guaranteed long-term payment alone make the purchase of a PV system economic, as is now the case in the German program.

The CSI does not propose to include a financing component at this time. The CEC has a low-interest financing program for state and local government efficiency and self-generation investments, and many have taken advantage of these loans to install PV systems. Opportunities to expand access to low-interest financing will be explored further in the development of the CSI.

Appendix A

The CEC Emerging Renewables Program (ERP)

The ERP was created by Assembly Bill (AB) 1890,[8] the legislation which adopted the framework for a competitive electricity industry in California. AB 1890 established a separate utility rate component known as the Public Goods Charge (PGC) to fund energy efficiency and renewables development. The ERP provides incentives primarily for small solar and wind projects. The CEC staff receives and processes all program applications, and authorizes individual rebate amounts. Rebates are based on installed capacity; most current rebates for PVs are $2.80 per watt.

Until 2001 there was minimal interest in the program. As the energy crisis progressed, program demand increased, and funds became scarce. On several occasions, funds were transferred from the state's General Fund and other

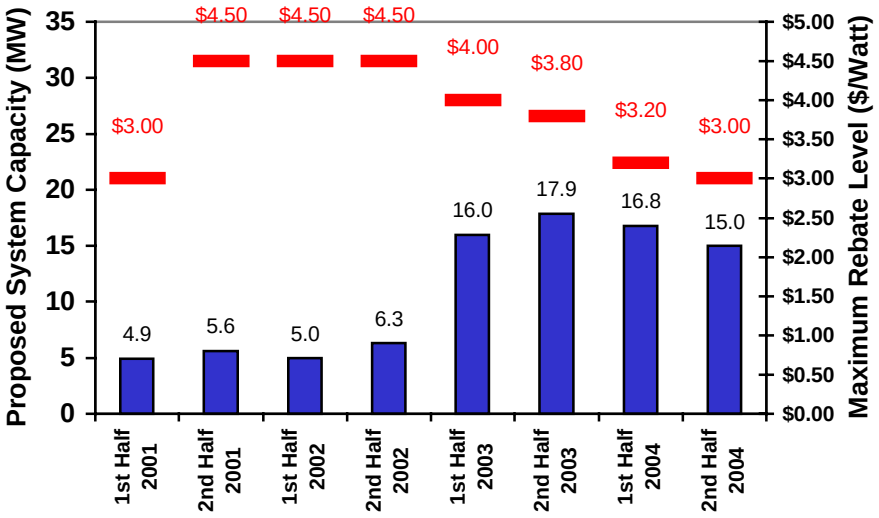
[8] Statutes of 1996, Chapter 854, Brulte

Renewable Resources Trust Fund accounts into the ERP to meet the rising demand. In 2002, the legislature approved the 5 year investment plan and allocated 17.5 percent of the Renewable Energy Program Funds ($118 million) for the ERP, which equates to less than half of the annual demand for rebates in the prior two years. The Energy Commission began accepting applications on March 3, 2003. Significant 2003 program changes included the following:

- Reduced rebate from $4.50 per watt to $4.00 / watt.
- Eliminated the cap that kept incentive payments under 50% of installed costs.
- Developed a schedule for rebates to decline $0.20 per watt every July 1 and January 1,
- Limited participation to projects less than 30 kW to reduce overlap with the SGIP.
- Allowed five years of funding to be made available on a first-come first-served basis to reduce uncertainty of funding availability.

Despite the rebate level reductions, ERP participation nearly doubled from the previous two years. The following chart (Figure 1) shows the system capacity for applications received as the rebate level has changed.

Figure 1: ERP Participation2001-2004



Since 1998, ERP allocated a total of $371 million for customer rebates to offset system purchase costs. The CEC estimates current funding will last through 2005.

The CPUC Self-Generation Incentive Program

In response to the energy crisis, the Legislature adopted AB 970 (2000), which directed the CPUC to develop an incentive program for super clean and renewable distributed generation. AB 1685 (2004) extended the Self Generation Incentive Program (SGIP) through 2007. The Commission adopted an annual statewide budget of $125 million through 2007, allocated equally among three program levels.

- Level 1: Solar, wind, renewable fuel cells greater than 30 KW.
- Level 2: Fuel cells
- Level 3: Microturbines, gas turbines, internal combustion engines

Today, SGIP solar incentives are $3.50 per watt, and are scheduled to decline to $3.00/watt on January 1, 2006. SGIP program costs are recovered through the gas and electric distribution rates of Pacific Gas and Electric, Southern California Edison, Southern California Gas Company, and San Diego Gas and Electric, proportionate to annual sales revenues. PG&E, SCE, and SoCalGas administer the SGIP in their respective service territories; the San Diego Regional Energy Office is the program administrator for SDG&E. A Working Group comprised of the program administrators and CPUC and CEC staff oversees program implementation to ensure consistent treatment statewide.

As with the CEC's ERP, the majority of SGIP rebates are paid to solar projects. Similarly, funds have been transferred several times from other program budget areas to fund solar projects. A total of about $400 million was

paid or reserved for PV systems from 2001 to 2004 with most of the participation in the SGIP occurring in 2003 and 2004. The program currently has a waiting list and is closed to new applications.

By the end of 2004, the SGIP was oversubscribed, and PG&E and SDREO created waiting lists. When the SGIP began accepting new applications at $3.50/watt in February 2005, nearly all applicants on the waiting lists chose to accept $3.50/watt instead of waiting an indeterminate period for the $4.50/watt for which they had originally applied. Reducing the incentive level did not deter projects from moving forward. By March 2005, the SGIP was again fully subscribed, receiving applications roughly equivalent to 10 years of the allocated budget. SGIP incentives for other technologies are not oversubscribed, and participation in the ERP remains robust, even as incentives are reduced.

Table 1 shows a simple comparison of system prices for commercial projects participating in the ERP and SGIP from 2001 through 2004. The median price for systems in the ERP (0 to 30 kW) decreases as system sizes increase. Median system costs for SGIP-funded projects between 30kW and 45kW are $9.00, and then decrease to $7.63 for projects 500kW to 1MW. The number of commercial projects participating in the ERP increased even as rebates declined from $4.50 per Watt to $3.00 per Watt.

Table 1: PV System Prices for Systems Completed And Reserved 2001 to 2004

System Size	Program	Number	Median Price
0 to 5 kW	ERP	13,682	$9.20
5 to 10 kW	ERP	3,391	$8.61
10 to 15 kW	ERP	524	$8.42
15 to 20 kW	ERP	176	$8.26
20 to 25 kW	ERP	105	$8.12
25 to 30 kW	ERP	170	$8.04
30 to 35 kW	SGIP	126	$9.00
35 to 40 kW	SGIP	34	$8.99

40 to 45 kW	SGIP	28	$9.00
45 to 50 kW	SGIP	41	$8.63
50 to 100 kW	SGIP	143	$8.98
100 to 200 kW	SGIP	119	$8.80
200 to 500 kW	SGIP	97	$8.06
500 to 1000 kW	SGIP	130	$7.63

(END OF ATTACHMENT 1)

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of Assigned Commissioner and Administrative Law Judge's Ruling Seeking Comment on Staff Solar Report by using the following service:

☒ E-Mail Service: sending the entire document as an attachment to all known parties of record who have provided electronic mail addresses.

☒ U.S. Mail Service: mailing by first-class mail with postage prepaid to all known parties of record who did not provide electronic mail addresses.

Dated June 14, 2005, at San Francisco, California.

/s/ Antonina V. Swansen
Antonina V. Swansen

N O T I C E

Parties should notify the Process Office, Public Utilities Commission, 505 Van Ness Avenue, Room 2000, San Francisco, CA 94102, of any change of address to insure that they continue to receive documents. You must indicate the proceeding number on the service list on which your name appears.