

APPENDIX A



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**California Public Utilities Commission
Energy Division**

**California Solar Initiative
Proposed Low-Income Incentive Program
For Single-Family Homes**

April 17, 2007

Overview

This paper describes a California Public Utilities Commission (CPUC or Commission) staff-recommended structure and implementation strategy for a \$108 million incentive plan for single family, owner-occupied, low-income homes as part of the California Solar Initiative (CSI). Staff recommends providing incentives that substantially subsidize photovoltaic systems, which, in combination with energy efficiency measures, will offset energy loads for low-income households. Please note that the CPUC directed the mainstream CSI Program Administrators to submit a separate proposed incentive program for multi-family low-income residences to the CPUC by July 16, 2007 for public comment.

1. Introduction

1.1 Background

The CPUC is committed to helping create a sustainable market for solar technology through the California Solar Initiative. Through the CSI, residences (excluding new homes; see Section 2.1), businesses, non-profits and government agencies receive incentives to install solar photovoltaic (PV) systems.

In Decision 06-08-028,¹ the Commission directed that Pacific, Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Regional Energy Office (SDREO) (in the SDG&E service territory) administer the main CSI program incentives.

In August 2006, Governor Schwarzenegger signed Senate Bill 1 (SB 1), which directed the CPUC to provide incentives for “eligible solar energy systems,” including existing low-income residential housing that accommodates the limited financial resources of low-income residents by January 1, 2008.² SB1 contains a number of other requirements for state solar incentives relating to time of use (TOU), warranties, and other issues. Assembly Bill 2723 (AB 2723 or “the Pavley Bill”), which was signed by the Governor in September 2006, also describes requirements for low-income solar incentives. It requires the CPUC to ensure that “not less than 10% of the overall funds for the California Solar Initiative are utilized for the installation of solar energy systems, as defined, on low-income residential housing, as defined.”³ The Pavley Bill also allows the Commission to “modify the monetary incentives made available pursuant to the California Solar Initiative to accommodate the limited financial resources of low-income residential housing.” Per CPUC Decision 06-12-033,⁴ this proposed strategy is only applicable to electric customers of PG&E, SCE and SDG&E.

The CPUC 10-year CSI program has a total budget is \$2.168 billion. Consistent with AB 2723, in D.06-01-024,⁵ the CPUC reserved 10 percent of the CSI’s funds for an incentive program for low-income residences throughout California. As a result, \$216.8 million is designated to provide incentives and financing for existing low-income, single-family and multi-family residences. The

¹ August 24, 2006

² SB 1, Chaptered August 21, 2006. Statutes of 2006.

³ AB 2723, Chaptered September 30, 2006, Statutes of 2006.

⁴ December 14, 2006.

⁵ January 17, 2006

February 5, 2007 “Assigned Commissioner’s Ruling Revising Schedule for Phase Two” directed half of that budget (\$108 million) to be designated for the single-family, owner-occupied low-income strategy.

CPUC Energy Division staff will hold a public workshop on April 30, 2007 at the CPUC in San Francisco to review this staff proposed strategy and gather input. Please check the CPUC CSI website for more information.

1.2 Target Audience and Technologies

Description of Eligible Populations for the CSI Strategy

This strategy’s eligible populations are defined by statutory requirements under AB 2723. AB 2723, which became Section 2852 of Public Utilities Code, defined low-income residential housing for single-family homes that would be eligible for CSI incentives as either:

“(A) Residential housing financed with low-income housing tax credits, tax-exempt mortgage revenue bonds, general obligation bonds, or local, state, or federal loans or grants, and for which the rents of the occupants who are lower income households, as defined in Section 50079.5 of the Health and Safety Code, do not exceed those prescribed by deed restrictions or regulatory agreements pursuant to the terms of the financing or financial assistance.

(B) A residential complex in which at least 20 percent of the total units are sold or rented to lower income households, as defined in Section 50079.5 of the Health and Safety Code, and the housing units targeted for lower income households are subject to a deed restriction or affordability covenant with a public entity that ensures that the units will be available at an affordable housing cost, as defined in Section 50052.5 of the Health and Safety Code, or at an affordable rent, as defined in Section 50053 of the Health and Safety Code for a period of at least 30 years.”

Therefore, eligible single-family, owner-occupied households for the CSI low-income incentive program include homeowners who have received financial assistance to buy or maintain their homes with government loans, grants or bonds. These definitions of eligible population do not correspond to two existing state programs that target low-income utility customers, California Alternative Rates for Energy (CARE) or the CPUC Low Income Energy Efficiency (LIEE) program (see Section 2.3 for more detail). Under AB 2723, low and moderate-income homeowners may be eligible for low-income solar incentives because they bought their homes at an “affordable housing cost” or a below-market rate. They may have received assistance through housing agencies such as the U.S. Department of Housing and Urban Development (HUD) and the California Department of Housing and Community Development (HCD). Both agencies have higher income limits than CARE/LIEE (approximately \$50,000 to \$60,000 in most urban areas; up to \$126,000 in other areas).⁶

AB 2723 relies on the California Health and Safety Code to define “lower income households” and describe affordable housing costs.⁷ The Code establishes definitions for Extremely Low-Income, Very Low-Income, Low-Income and Moderate-Income households, as well as eligibility for affordable

⁶ HCD State Income Limits of 2006 for a household of 4.

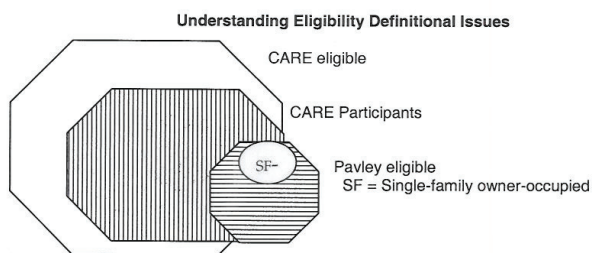
⁷ Defined in the California Health and Safety Code, Section 50052.5.

housing assistance as a percent of a “median area income,” per “area,” but it does not provide income levels. Staff therefore used HCD’s State Income Limits as a guideline to assess California area median incomes, and ultimately to help staff to better understand the financial abilities of eligible populations under AB 2723. As evident in Table 5 in Section 3.3, income limits vary widely across the state.

In late 2006, CPUC staff worked with PG&E, SCE, and SDG&E to identify the populations that would be eligible for a CSI low-income program under AB 2723 and who overlap with LIEE/CARE definitions. The reason to identify these overlaps is to determine which California households have access to additional incentives and assistance that can further reduce their energy bills and therefore maximize the use of the CSI low-income incentives.

The analysis found roughly 3.3 million electric service-taking households in California in the three investor-owned utility (IOU) territories that are eligible under CARE/LIEE (assuming \$40,000 income and family of 4). The IOUs cross-referenced their customer databases against government housing assistance databases from HCD, HUD, and other state agencies. From this analysis, staff determined that there may be approximately 420,000 single- and multi-family households across California that meet the AB 2723 definitions. Approximately 370,000 are multi-family households. Based on these very rough calculations, Energy Division staff believes that there may be 50,000 single-family households under the CARE program that comply with the income limits under AB 2723. Please note this figure does not include non-CARE eligible customers that comply with AB 2723.

Figure 1



The Commission is currently seeking an expansion of the definition of low-income residential housing, so that solar incentives could be offered to not only low-income Californians who have received government housing assistance, but to other households that are eligible for other low-income, utility bill and efficiency assistance programs. The intent of expanding the definition of low-income residential housing is to allow a larger

population of low-income households to receive the benefits of solar technology. In the interest of allowing more populations to benefit from solar technology, Senator Migden introduced Senate Bill 324 (SB 324) on behalf of the Commission, in February 2007. SB 324 expands the definition of low-income residential housing to include households that are enrolled in California CARE and/or LIEE programs. In the event that SB 324 is passed, this proposed CSI low-income incentive program for single-family homes will be modified to address these new populations.

Solar Technology as Defined by AB 2723

AB 2723 also defined a solar energy system as a “solar energy device that has the primary purpose of providing for the collection and distribution of solar energy for the generation of electricity, that produces at least one kilowatt” of electricity. Through research with the IOUs, staff believes that the majority of water heating systems in low-income homes in California use gas; only 6% use electricity.

SB 1 precludes CSI incentives for gas-displacing technologies. Therefore, this paper addresses incentives only for solar PV systems.

2. Other Low-Income Outreach Programs

2.1 California Energy Commission Programs

The California Energy Commission (Energy Commission) implements the \$350 million, 10-year New Solar Homes Partnership (NSHP) which promotes solar in new home construction. The NSHP works with builders and developers to incorporate solar technology and energy-efficiency measures in newly constructed homes. The Energy Commission is also overseeing a program for installing solar technology on new multi-family affordable housing constructions.

Significant factors limit close coordination of the CSI and NSHP low-income programs. While the CPUC and Energy Commission programs both target single and multi-family affordable housing, the CPUC oversees programs for *existing* housing and the Energy Commission oversees programs for *new* housing. Financing for new affordable housing is wholly different than that for existing low-income residents. Stakeholders and service providers are different between programs. The Energy Commission program also involves energy efficiency goals based on the California Title 24 building code for new construction.

2.2 Low-income Solar Programs

Based on our research, staff can find no long-term, low-income, PV incentive programs elsewhere in the U.S. to refer to as a model for this program. However, staff identified four small California pilot programs that currently target low-income single family homes to promote solar PV and solar thermal technology. For a list of staff findings on low-income solar PV pilots outside of California, please see Appendix A.

2.2.1 *Grid Alternatives*

Grid Alternatives, a San Francisco-based non-profit, appears to be the largest solar program that targets low-income communities in California. Since 2004, Grid Alternatives has provided solar installations on low-income single family homes throughout the San Francisco Bay Area. Grid Alternatives predominantly uses volunteers and contracted solar installers to install PV systems on low-income homes. Some installations are fully-subsidized through grants and donations, and others are financed through local government housing agencies. At times, Grid Alternatives partners with Habitat for Humanity on selected projects. Grid Alternatives expects to install 70 to 80 PV systems this year.

2.2.2 *California Department of Community Services and Development Solar Pilot Program*

Funded through the California Department of Community Services and Development (CSD), the non-profit organization SoCal Forum is administering a solar pilot program to install solar hot water heaters in low-income homes. Installation and equipment costs of the solar water heaters are fully-subsidized.

CSD and SoCal Forum are working with several community-based organizations in California to deliver this program.

In 2006, CSD began developing a demonstration project of small 1 kW PV systems for low-income single-family homes. The intent of the program is to create an affordable market for solar PV systems. CSD and ACCES work with manufacturers to develop a 1 kW PV system that cost approximately \$5,000 to \$7,000. (SoCal Forum and ACCES are separate non-profit organizations that share staff.) Once available, the small PV systems will be installed on low-income homes through a subsidy that covers 100% of the system and installation costs. The PV systems are currently still under development and have yet to be installed on low-income households.

2.2.3 BP Solar Neighbors

Founded by the actor Edward Norton, the BP Solar Neighbors program is a joint collaboration between BP Solar, the Enterprise Foundation, and the Environmental Media Association in the Los Angeles area. The program donates PV systems to low-income families through a model where for every solar PV system purchased by a celebrity, BP will donate a similar system to be installed on a low-income home. The installation is fully-subsidized.

2.2.4 Bayview Hunters Point Community Advocates Solar Program

Funded through an environmental justice grant with the City of San Francisco, Bayview Hunters Point Community Advocates has a solar program that provides solar training and installs fully-subsidized PV systems on homes in the Hunters Point neighborhood of San Francisco. Bayview Hunters Point Community Advocates provided classroom training to 25 local residents on the benefits of solar. In addition, the solar companies were required to temporarily hire and provide on-the-job training to Bayview residents. Since their inception in 2001, the non-profit has installed 40 systems in the Bayview neighborhood including 36 systems on residential buildings and four systems on non-profit buildings.

2.3 Low-income Energy Programs

The CPUC also oversees two existing programs that target low-income homes with energy assistance. The first is CARE, a program that provides discounts on electricity and gas bills. The second program is LIEE, which provides fully-subsidized weatherization and installation of energy efficient appliances in low-income homes at no cost to the customer. Eligible customers for both LIEE's and CARE's gross household income are within 200% of the federal poverty guidelines. Note that the LIEE levels differ from HCD State Income Limits, and they do not vary by city or county. The breakdown of income limits for CARE and LIEE programs is as follows:

Table 1: LIEE Income Limits

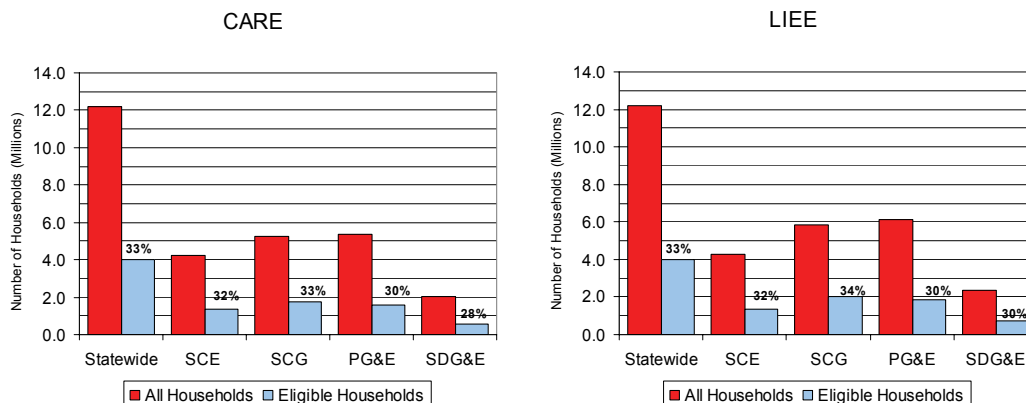
Household Size	LIEE Income Limit
1 to 2	\$28,600
3	\$33,600
4	\$40,500
5	\$47,400
6	\$54,300
Each additional member	\$6,900

At the Federal level, the Low-Income Home Energy Assistance program (LIHEAP) is administered by CSD in California. Through local and state government agencies and non-profits, eligible low-income individuals can receive financial assistance and weatherization services such as insulation and weather-stripping to lower and pay energy bills.

Characteristics of California's Low-Income Population

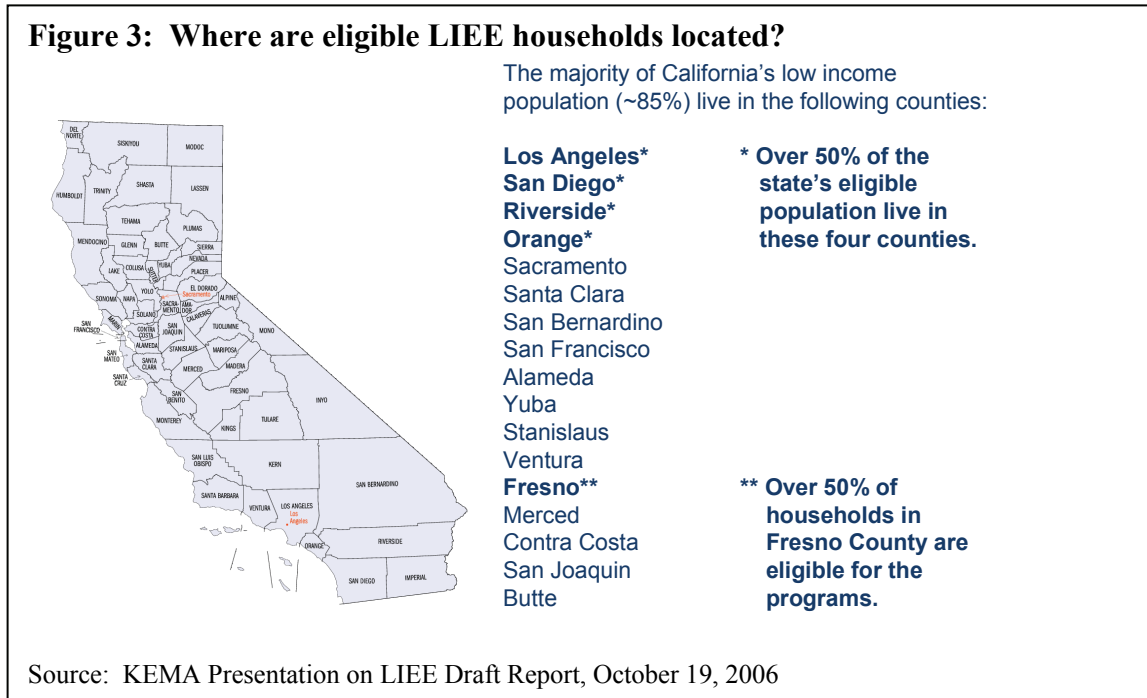
In October 2006, KEMA presented a draft report to the CPUC on a Low Income Needs Assessment for Phase 2 of the LIEE program.⁸ Their analysis of California IOU data revealed that about 4 million California households are eligible for CARE and LIEE – or 33% of all households in the state. Included in this 4 million are households served by SoCal Gas and gas customers of PG&E and SDG&E that might be served by municipal electricity utilities. Approximately three of four million are served by the three electric IOU's over which the CPUC has jurisdiction for CSI purposes. They also found that CARE and LIEE-eligible customers is highest in the service territory of PG&E and lowest in the service territory of SDG&E.

Figures 2 and 3 present a basic overview of both single and multi-family LIEE-eligible populations in California. Staff aims to further break down these figures for single-family homes by the April 2007 staff workshop on this proposal.

Figure 2: How many CA households are eligible for CARE and LIEE?

⁸ KEMA. *Low*

According to KEMA, more than half of the state's low-income population live in just four counties – Los Angeles, Orange, Riverside and San Diego. For Fresno County, roughly 50% of all households in the county are eligible for the LIEE program.



KEMA found the following key characteristics of households with greatest need for the LIEE and CARE programs:

- **Geographic** – Central Valley, especially Sacramento County
- **Demographic** – Hispanic and African-American households, large families (5+), limited education, disabled households
- **Housing** – Built between 1970-1994, relatively small (< 1,000 square feet), use older natural gas heating systems, slab or crawl space foundation, attic space
- **Energy use** – Use natural gas for major equipment and appliances, consumption is much higher than baseline levels (during winter especially)

Note that this population study is broader than AB 2723's definition of eligible population for this strategy due to the statute's housing assistance requirements. The above study also does not include the Moderate-Income population that complies with AB 2723 and is eligible for the CSI low-income incentives.

Coordination with the LIEE Program

SB 1 requires that by "January 1, 2008, the [CPUC], in consultation with the [Energy Commission], shall require reasonable and cost-effective energy efficiency improvements in existing buildings as a

condition of providing incentives for eligible solar energy systems, with appropriate exemptions or limitations to accommodate the limited financial resources of low-income residential housing.” Staff recommends that CSI customers be encouraged to fully take advantage of energy efficiency measures that yield energy savings at lower cost before choosing to install a PV system. LIEE and CARE programs complement CSI objectives by promoting energy efficiency and reducing energy expenses in low-income populations.

In the event that applicants meet eligibility requirements under both the CSI low-income and LIEE programs, staff recommends coordinating with the LIEE program to provide energy efficient upgrades paid from LIEE budgets that will help offset the electricity load. These efforts should help these customers understand the suite of available energy management options as well as help them determine which or what combination of these options makes the most sense given their specific situation. However, staff must work first with the LIEE program to carefully demarcate the costs and benefits of all coordinated expenses (outreach and measures) and develop a plan for the allocation of these costs to either the LIEE or the CSI programs.

3. Proposed Low-Income Incentive Program

The following proposal includes a program strategy, incentive structure, energy efficiency requirements, budget, administrative structure, and evaluation. The overall CSI program strategy aims to make customer-sited solar electricity competitive with retail electricity by 2016. The low-income incentive program should work within this framework to help reach homeowners that most likely do not have the financial means to purchase and benefit from solar technology at the incentive levels available through the mainstream program.

3.1 Program Goal

Staff proposes that the goal of the low-income single-family incentive program is to provide access to PV systems for low-income, owner-occupied, single-family homes to decrease electricity use and electricity bills without increasing monthly household expenses. Staff recommends the program objectives be to maximize the number of households served and maximize energy bill savings.

With this proposal, staff aims to stretch the program funding as far as possible. Staff seeks input on innovative proposals to further improve performance or reduce solar costs to low-income residents. The first means is by ensuring energy efficiency measures are installed with the solar installation, as envisioned under SB 1. Other examples could be a flat incentive for all homes in the strategy, a single installer contract across the state, bulk purchases, lower overhead solutions, etc.

3.2 Program Strategy

The following strategies should be used to achieve the program goal:

1. Create an incentive structure that renders the economics of solar systems attractive to low-income households.

Staff recommends the following general incentive recommendation:

- Provide an incentive structure along a sliding scale that takes into account a household's eligibility for CARE rates and its ability to take advantage of the federal tax credit equal to 30% of system costs up to \$2000 to help subsidize the system.

The economics of solar will vary depending on a number of factors. Key among these are the electricity rates that customers face as well as the availability and value of federal tax credits. Lower electricity rates, like those under the CARE program, hurt the economics of solar, all else equal, by reducing the value of avoided electricity purchases. Each kWh of electricity produced by a solar system will be worth less in dollar terms to a customer paying lower rates per kWh relative to a customer who pays more per kWh. Thus, in order to be motivated to install a system, customers on CARE rates will need to be offered higher incentives than customers taking service on an unsubsidized basis in order to render the economics equally attractive. Additionally, the value of federal tax credits may vary by household based on their federal income tax burden. The ability to use federal tax credits is contingent on having a tax liability against which to apply any credits received. While a system may be able to receive up to \$2000 in federal tax credits, if the purchasing household does not have a tax burden against which to apply these credits, they are of limited value. All else equal, households that are unable to take advantage of federal tax credits will face more out-of-pocket costs relative to a household that is able to use federal tax credits. Higher incentives to those that are unable to use federal tax credits because of limited tax liability can help ensure that the economics of solar remain attractive to these households.

Staff recommends that the incentive be paid in a one-time, upfront payment to eligible recipients. Staff believes this approach addresses the relatively limited ability of prospective low-income system owners to finance the entirety of a system's up-front costs, whether out-of-pocket or via a loan. Therefore, the Program Manager and recipient would be better served by one up-front incentive per income level. Because the primary goal of the low-income incentive program is to provide access to PV systems, rather than promote market transformation, staff recommends that the incentives be non-declining over the program's duration. However, as part of the biennial evaluation, described in Section 5.1, the Commission will consider the incentive amount and may adjust it based on market changes in solar system costs. Section 3.3 describes the proposed incentive amounts in detail. The amount of incentive a household is eligible to receive may depend on required energy efficiency measures, as described in Section 3.4. Note that the size of the system cannot exceed the onsite load, as in the mainstream CSI program.

Staff recommends that the incentives be tied to the performance of the system but not quite as rigorously as incentives in the mainstream CSI program. Each installation will have a minimum performance requirement: staff suggests a minimum 0.95 Design Factor as calculated by the EPBB

calculator tool. However, staff does not recommend modifying the incentive on a customer-specific basis using the specific tilt, shading, orientation, or geography as in the mainstream CSI program. In other words, if a proposed system meets the .95 requirement, it is eligible for the entire incentive. If it does not meet the .95 requirement, it is ineligible for any incentive. Efforts to identify and market this program's target population will already be challenging. Staff believes that it would be unfair to add this element to the Program Manager's efforts with a more complex incentive, where the changing incentive level may make it harder to market to consumers and financiers.

Staff recommends that the CPUC uses CSI funds only for incentive payments rather than loans because CSI funds are paid through the utilities, and it would be too complicated to create and implement a financing structure rather than provide upfront incentive payments. The cost of creating a more complex financing program with CSI funds could potentially drive up administration costs, which would then decrease funds used for incentives. Therefore, staff recommends that CSI funds be used exclusively for incentive payments, and any financing through loans be outsourced through housing agencies and banks, as described in Section 3.3.

The minimum size of a system for eligibility is 1 kW due to SB 1 requirements.

2. Deliver low-income incentives and install PV systems beginning in a few California regions

Staff recommends commencing the CSI low-income program in a few areas of each investor-owned utility territory, and then serving more areas within those service territories over time. The Program Manager will need time to establish installation and financing partnerships and build up their networks. As the Program Manager refines its delivery and presence, it can expand within each IOU territory. This way the program's effectiveness can be tested in these pilot regions before being extended statewide.

3. Create marketing and outreach program that targets low-income customers

Staff proposes that the Program Manager develop a narrowly targeted marketing and outreach program solely for eligible low-income recipients under AB 2723.⁹ The Program Manager will collaborate with housing agencies to find and attract eligible households. The marketing and outreach plan must align with the language needs of low-income communities, and meet the Dymally-Alatorre Bilingual Services Act of California (1973) state law that guides the provision of information to Low English Proficiency populations. The outreach program will teach recipients to inspect and maintain the PV system in order to ensure its benefits to their energy bills, and includes information regarding the various measures, including behavioral changes, energy efficiency, and solar, that recipients can use to manage their energy usage and bills. Furthermore, information should be provided regarding where state assistance for energy efficiency measures can be obtained.

In addition, the Program Manager must take steps to ensure that the incentive levels are equitably allocated across income levels (i.e., the majority of incentive recipients should not be moderate-income households).

⁹ If SB 324 should pass, it will work with the IOU's to find LIEE/CARE recipients.

4. Create an education program on solar technology and energy efficiency

PV system ownership requires that the Program Manager provide education on system maintenance. Because low-income homeowners may be unfamiliar with the benefits of solar technology, the CSI low-income program must create materials and a plan to educate low-income customers on solar technology. This plan can work in conjunction with the marketing and outreach plan. Its purpose should be to help low-income customers understand how solar PV systems can help reduce their energy bills, and benefit the environment. The plan should also teach homeowners how to maintain a PV system over the long-term.

The Program Manager will develop outreach materials, such as fact sheets on solar technology and energy efficiency, to educate consumers on PV technology, financing, and maintenance. Staff recommends that the education plan include making low-income homeowners aware of the benefits of both. The plan may also need to educate consumers on the federal tax credit and how to complete tax statements to obtain it.

3.3 Incentive and Financing Structure

Staff-proposed incentives will mirror the general CSI for performance and TOU requirements. First, staff recommends a minimum performance requirement corresponding to a Design Factor of 0.95 using the EPBB calculator tool in order for a system to receive an incentive. However, unlike incentives in the mainstream program, incentives offered under the low-income program are an “all or nothing” proposition. As described above, if a system meets the .95 Design Factor it is eligible to receive the full per watt incentive. If the system has a Design Factor that is less than the .95 criterion, then it is ineligible for incentives. Based on staff review of SB1, staff also believes that time of use rates are required for the low-income customers who are eligible for this strategy. SB1 requires “time-variant pricing for **all** ratepayers with a solar energy system.”¹⁰ (Emphasis added.) Staff seeks input as to whether the proposed incentives below will be appropriate for these consumers under existing TOU rates.

Staff recommends an incentive structure that corresponds to the actual economics of solar for a given household. For example, households that are designated as “Very Low-Income” using California Health and Safety Code Section 50105 definitions, but are located in wealthy counties, may not be CARE eligible and furthermore, may have sufficient federal tax liabilities to take full advantage of federal tax credits. Both of these factors argue for lower incentives for such households relative to households that are CARE-eligible and have no federal tax burden against which to apply solar tax credits, irrespective of where those households fall in the preceding framework. In the case of the example household, non-CARE electricity rates increase the value of solar production and therefore reduce the incentives required to provide a certain payback or economic rate of return. Similarly, the availability of federal tax credits reduces the cost of a system, further reducing the need for CSI incentives. In light of this, staff proposes basing the incentive level a low-income (as defined by AB 2723) household may receive on a household’s CARE eligibility and the household’s estimated federal tax liability.

¹⁰ SB1, Section 7, Public Utilities Code section 2851

To derive the incentive schedule shown in Table 2, staff evaluated the incentive amount that would need to be provided in order for an investment in a solar system to generate an internal rate of return (IRR) of 10%, given different assumption regarding a household's CARE eligibility and its ability to take advantage of federal tax credits. These credits are equal to 30% of system costs, up to \$2000. In general, higher-income households should require less of an incentive to produce the targeted IRR for a number of reasons including higher, non-CARE electricity rates, which increase the value of avoided electricity purchases, as well as higher marginal tax rates. With respect to the latter, staff assumed that the out-of-pocket system costs would be financed using a 6%, 25-year loan. The interest on this loan is assumed to be tax deductible and therefore is worth more to higher income households due to the higher marginal tax rates they face. The results of staff's analysis, however, indicate that that differences in marginal tax rates associated with different income levels yield relatively small differences in the incentive level necessary to achieve a 10% IRR. Most of the difference in the incentive levels across households is attributable to whether a household is CARE eligible and whether or not it is able to take advantage of federal tax credits.

Staff notes that determination of which incentive level a household qualifies for could be based on an applicant household's prior year's federal income tax statement(s), which could be used to determine both the household's CARE eligibility as well as the extent to which the household can take advantage of federal tax credits. The ability to use federal tax credits could be estimated using a household's prior year's federal tax liability up to \$2000.^{11, 12} Using this approach to estimating the incentive necessary to achieve a 10% IRR yields the results shown below. Note that for every \$100 in federal tax burden, up to \$2000, the per-watt incentive a household would be eligible for declines by \$.05. This result is driven by the assumed system size of 2 kW.

Table 2: Incentive Structure

Federal Income Tax	CARE-Eligible Household	Non-Care Eligible Household
\$0	\$7.20	\$5.80
\$100	\$7.15	\$5.75
\$200	\$7.10	\$5.70
\$300	\$7.05	\$5.65
\$400	\$7.00	\$5.60
\$500	\$6.95	\$5.55
\$600	\$6.90	\$5.50
\$700	\$6.85	\$5.45
\$800	\$6.80	\$5.40
\$900	\$6.75	\$5.35
\$1,000	\$6.70	\$5.30
\$1,100	\$6.65	\$5.25
\$1,200	\$6.60	\$5.20
\$1,300	\$6.55	\$5.15
\$1,400	\$6.50	\$5.10
\$1,500	\$6.45	\$5.05

¹¹ As a condition of receiving an incentive, the applicant could be required to submit a tax return from the prior year.

¹² Another approach would be to assume that the value of federal tax credits is equal to twice the households federal income tax burden up to \$1000, since, federal tax credits that go unused in one year can be applied to the succeeding year. Thus a household that only pays \$1000 in federal income tax each year would be able to take advantage of the full \$2000 in federal tax credits. On the preceding table this would translate into a reduction of \$.10 for every \$100 in federal income tax burden up to \$1000.

Federal Income Tax	CARE-Eligible Household	Non-Care Eligible Household
\$1,600	\$6.40	\$5.00
\$1,700	\$6.35	\$4.95
\$1,800	\$6.30	\$4.90
\$1,900	\$6.25	\$4.85
\$2,000	\$6.20	\$4.80

To derive these values in the preceding table, the following assumptions and parameters were used:

- System Size: 2 kW
- System Cost: \$9/watt
- Capacity Factor .18
- CARE rate: \$.085/kWh
- Non-CARE rate: \$.14/kWh
- Rate Escalation: 3% per year
- Inverter Replacement Cost (nominal dollars): \$975
- Inverter Replacement Year: 15
- Target Internal Rate of Return: 10%

Using these incentive levels and assumptions, staff also derived estimates of the monthly loan payments that would be required to cover the outstanding, or out-of-pocket, system costs assuming a 25-year loan and a 6% interest rate. Staff seeks comment on whether such a loan is reasonable given the relatively small amount of the outstanding system costs once an incentive is provided.

Table 3: Cost of a monthly loan

CARE-Eligible Household	Non-Care Eligible Household
\$23	\$41

To better understand the number of CARE eligible populations in counties with varying income limits, please refer to Table 4 below:

Table 4: CARE-eligible populations in low, medium and high-cost counties¹³

Household Income (Per Pavley Bill Groupings)	Sample CA County Income Eligibility¹⁴		
	Low	Med	High
Extremely Low-Income	\$15,250	\$20,700	\$33,950
Very Low-Income	\$25,400	\$34,500	\$56,550
Low-Income	\$40,650	\$55,200	\$90,500
Moderate-Income	\$61,000	\$77,900	\$114,000

For each of these groups, staff recommends that the remaining costs be obtained through local banks and housing agencies, the Program Manager will work with private sector banks (which are required by California law to provide low-interest community loans) to develop an appropriate finance package. Staff recommends the Program Manager partner with city and county housing agencies to finance the loan and to explore more flexible loan options, such as lower interest rates, longer loan terms and deferred loans. These agencies typically provide more flexible financing options than banks for low to moderate-income constituents.

3.4 Energy Efficiency

Consistent with the SB 1 requirement of “reasonable and cost-effective energy efficiency improvements in existing buildings as a condition of providing incentives for eligible solar energy systems,” staff recommends all solar incentive applicants must have an energy efficiency audit as part of the application process. The audit will allow customers and the Program Manager to compare the costs of a solar installation against the savings from both LIEE and non-LIEE IOU incentive measures. These side-by-side comparisons will educate the applicant as to what approach or combination of approaches make the most sense to meet their energy needs. Based on the audit results, the Program Manager will determine which energy-efficiency measures must be undertaken and therefore the appropriate size of the solar system that is eligible for incentives. Just as in the mainstream program, the size of the system cannot exceed what would be needed to offset 100% of annual onsite load. Estimates of onsite load, and thus maximum system size, will be adjusted to reflect the deployment of those energy efficiency measures that the Program Manager determines must be implemented. Staff seeks comment on how the annual load impact of these energy efficiency measures should be estimated for a given household.

If the household is eligible for LIEE services and is not enrolled in the program, staff recommends that the Program Manager require the household to enroll in the LIEE program within one year of receiving the solar rebate. For reference, LIEE direct-install energy efficiency measures cost approximately \$1500 per household.

If the applicant has already received an audit and weatherization services through the LIEE program, the Program Manager will review the costs and benefits of additional IOU energy efficiency incentive measures against the costs of various solar sizes with the applicant. While discretion will be left to the

¹³ The shaded area in Table 4 illustrates how CARE/LIEE eligibility definitions overlay with eligible populations under AB 2723.

¹⁴ HCD 2006 State Income Limits for a four-person family. Low= Imperial County, Medium = San Diego County, High= San Francisco County. Please note that these area incomes are used as guidelines, and may vary from the income limits of other housing agencies that also provide assistance such the U.S. Department of Housing and Community Development (HUD).

Program Manager to choose the particular energy efficiency measures in consultation with the applicant, staff believes it is reasonable to require implementation of all energy-efficiency measures identified in the audit that have up to a two-year payback.

If the applicant is not eligible to receive LIEE-subsidized weatherization services, staff recommends that they be required to undergo an energy-efficiency audit, undertake basic weatherization measures, and be required to undertake energy efficient upgrades that have up to a two-year payback before receiving the solar incentive. The maximum system size that will be eligible incentives will be capped based on an estimate of the household's annual load that assumes these energy efficiency (with a two-year or less payback) and weatherization measures have been undertaken.

3.5 CSI Low-Income Program Budget

Staff recommends allocating the budget for the entire low-income incentive program for single-family, owner-occupied homes over a 5-year period. This way, the budget can benefit more low-income homes earlier in the CSI program.

In accordance with CPUC Decision 06-12-033, which sets out CSI program budgets per IOU, the proposed breakdown of the low-income budget by utility is as follows:

Table 5: CSI Program Budget by Utility

Utility	Percent of total budget	CSI Budget (in millions)	Low-Income Budget (in millions)
PG&E	43.7%	\$ 947	\$ 94.7
SCE	46.0%	\$ 997	\$ 99.7
SGE&E	10.3%	\$ 223	\$ 22.3
Total	100%	\$ 2,168	\$ 216.8

At this time, staff does not know if these percentages correlate to the percentage of the eligible population for this strategy in each IOU territory. Staff seeks input on this issue, as well as on other approaches to allocating the low-income budget.

Staff aims to reduce administrative costs for this program in order to stretch incentive dollars further. Staff seeks input and evidence on the typical administrative percentages from entities that are currently performing similar solar installation services. For example, staff examined the budgets for the LIEE program for reference on administration of the low-income incentive program for single-family homes. Both this solar incentive strategy and the LIEE programs both place a high priority on marketing, outreach, education and evaluation. We found that approximately 20 to 25 percent of the total LIEE budget for 2007 and 2008 was used for program administration, including marketing and outreach and program evaluation. Staff posit that this strategy could cost less. Staff recommends 10 percent of the budget be used for program administration, 4 percent used for marketing and outreach, and 1 percent contracted to an independent evaluator for the biennial program evaluation. Staff recommends up to

85 percent of the budget be used for incentives because the cost of subsidy per household is roughly \$9,600 to \$14,400, as opposed to \$1,500 per household for LIEE measures.

The proposed breakdown of the total budget and the annual budget is as follows:

Table 6: Total CSI Low-Income Budget for Single-Family Housing

	Total	Per annum
Incentives	\$92,140,000	\$18,428,000
Administration	\$10,840,000	\$2,168,000
Marketing and outreach	\$4,336,000	\$ 867,200
Evaluation	\$1,084,000	\$216,800
Total budget	\$108,400,000	\$21,680,000

Staff recognizes that it may take time to implement the program at a statewide level. In the event that the incentive budget is not exhausted in a program year because there has not been full market penetration of the program, staff recommends rolling over the incentive budget to the following year.

4. Administration

This section describes the required functions, necessary qualifications, and administrative options before recommending one Program Manager who oversees the program for low-income, single family, owner-occupied housing.

4.1 Personnel Functions

In order to run an effective program, the Program Manager will have the following functions:

- Establishing relationships with low-income, single family homeowners
- Establishing relationships with community-based organizations that serve low-income homeowners to conduct outreach
- Partnering and working with solar installers to install PV on target homes
- Hiring multilingual staff to meet language requirements of low-income populations
- Building organizational capacity to meet the demands of a statewide program
- Implementing the strategy at a statewide level
- Working with IOU's to direct incentive payments to eligible recipients
- Working with CPUC Energy Division staff and an independent evaluator to monitor and report on the program's progress
- Collaborating with the administrators of the Low-Income Energy Efficiency (LIEE) and California Alternative Rates for Energy (CARE) programs on delivery strategy
- Educating low-income customers on solar technology and energy efficiency measures
- Creating a marketing plan to attract eligible populations of all income levels
- Exploring other funding/co-funding options with corporations and government agencies
- Providing customer support, including responding to complaints/problems/maintenance needs

- Collaborating and partnering with city and county housing agencies to create in-place, flexible financing packages

4.2 Personnel/Organization Qualifications

The Program Manager should be adequately staffed with personnel who have the following qualifications and experience:

- Experience in installing solar PV systems
- Experience in serving low-income populations
- Experience in developing marketing strategies directed at low-income communities
- Experience in creating finance packages for energy efficiency measures and/or solar energy systems
- Knowledge of the needs of low-income, single-family homeowners
- Language ability for major language requirements of eligible low-income populations
- Knowledge of LIEE and CARE programs
- Experience and knowledge of energy-efficiency measures and energy audits at the residential level
- Widespread city and county government contacts throughout California
- Ability to create partnerships with private sector finance entities
- Existing relationships with affordable housing and environmental groups
- Ability to deliver program through collaboration with multiple stakeholders (i.e., no preexisting constraints on partnering latitude)
- Data gathering and analysis skills
- Experience managing state solar or energy efficiency rebates

4.3 Institutional Options

Staff considered five options concerning which entity would administer the program. In all five cases, the utilities, who are the entities collecting CSI funds through rates, would pay the administrator(s). CPUC will direct utilities to pay incentive recipients per administrator recommendations. The pros and cons of each option are detailed below. Table 7 summarizes these expected qualifications among generic examples.

Non-profit that serves low-income communities and installs solar PV systems

As Program Manager, the non-profit would install solar PV installations to low-income, single-family homes. They would use and build upon existing networks for program implementation and outreach. The organization would establish partnerships and leverage any existing relationships, with government agencies to provide financing for PV systems with low-interest, long-term loans wherever available. An organization like Grid Alternatives or BP Solar Neighbors, for example, may have experience installing solar PV systems in low-income homes but, may not offer breadth of services across the state.

Pros: The non-profit could have established relationships with low-income communities, solar installers, and financing agencies that can be used for program implementation. Their staff would have experience directly installing PV systems and energy efficiency measures in low-income homes. They may be apt to have a concrete understanding of the particular needs of single family, owner-occupied, low-income families. They can ramp up in new locations at relatively low cost. As a non-profit that receives grants and donations, they have experience in fundraising and possibly access to additional funding for the program. They have a vested interest in the environment and serving low-income communities. Overall, they are apt to be a low-cost administrator.

Cons: They may not initially have the staffing capacity to implement this program at a statewide level and may be slow to ramp up in other IOU territories. If the non-profit largely depends on volunteer staff, the entity may face challenges building staffing and installer resources in new areas of the state. As a result, the equitable rollout of the CSI low-income program may be impacted.

State agency that serves low-income communities

A state agency could potentially leverage existing networks with community-based organizations, solar installers, and financing agencies to implement the program. An agency like the CSD or even CPUC can leverage networks with community organizations, but would have little experience or partnerships with solar installers and financiers.

Pros: The state agency has a presence throughout California. They may have established relationships with community-based organizations who can deliver the program. They have previous program administration experience. They have a vested interest in the environment and serving low-income communities.

Cons: The existing delivery structure may have little or no solar experience and would need much training. Similarly, their marketing and education functions would suffer from the lack of solar knowledge. They may not have the ability to provide financing options. They lack flexibility in partnership with stakeholders outside of their existing networks. Implementation may be slowed because of government bureaucracy and delivery through community-based organizations, not staff. Accounting for the CSI program in a state bureaucratic office against other outreach programs could be very complex. The agency would be asked to implement a strategy its decision-makers have no authority to change, and there's a risk they could petition the CPUC to change the goals of the current CSI low-income strategy.

Consulting firm with experience in solar and affordable housing

As Program Manager, a consulting firm could consult with solar installers, financing agencies, and community-based organizations but hire installers for program implementation and outreach.

Pros: The consulting firm may leverage existing expertise in affordable housing and solar when implementing this program; they may also leverage their existing networks within these fields. They have the flexibility to work with multiple stakeholders and partners. They may have established relationships with non-profits that serve low-income communities. They may be able to use their existing research and work on affordable housing and solar to inform the CSI program.

Cons: They may have no direct experience with the delivery to low-income populations. They have no statewide presence. They may have no experience working with financing agencies and local governments. Additionally, because most of the administrator functions, such as installations and outreach, have to be outsourced, the administration costs could be much higher.

Bank that specializes in financing PV systems

As Program Manager, the bank provides financing options to low-income communities, as well as partner with solar-installers/third-party owners and community-based organizations for program implementation and outreach.

Pros: The bank can leverage expertise in financing and experience in solar technology. They can use their existing partnerships with other stakeholders, such as solar installers. If they provide loans for solar PV systems, they may have a vested interest in the environment, specifically renewable technology.

Cons: The bank may not be able to provide flexible financing options that target low-income groups. They do not have established relationships in low-income communities. Furthermore, it may be difficult to find an installer or third-party financier that has established trustworthy relationships with low-income populations, and this may become a barrier in marketing and outreach. They are profit-driven, not mission-driven organizations, creating potential distrust over their sincerity in serving low-income communities. They may have issues partnering with other stakeholders. This option is apt to be higher-cost. They may be challenged to identify and understand the needs of eligible low-income families. Finally, the cost of a bank paying installers and non-profits for outreach may raise costs and be redundant.

CSI Program Administrators (PG&E, SCE, and SDREO)

Mirroring the structure of the mainstream CSI program, the 2 investor-owned utilities (PG&E, SCE) and 1 non-profit (SDREO) could administer the program. Program implementation, marketing and outreach would take place in-house. Financing would be provided through partnerships with housing agencies and/or banks to provide loans.

Pros: They have solar incentive program administration experience and, therefore, expertise in managing and accounting infrastructure. Implementation of other low-income programs, LIEE and CARE, can be potentially leveraged from the PG&E and SCE. Combined, they have a statewide presence.

Cons: They may have no financing strategy in place, and may not have the ability to partner with agencies that provide financing options. There might be potential public perception concerns over sincerity, as well as potential issues with trust in low-income communities and parties that serve low-income communities. One of the administrators, SDREO, will not match LIEE/CARE's delivery. They will not do the actual installations on CSI, and contracting outside PV installers would raise costs. Having three administrators may add consistency concerns to an already complex strategy.

Please refer to Table 7 for a comparison of staff recommended qualifications for each institutional option.

Table 7: Staff Characterization of Generic Qualifications

	Non-profit	State Agency	Consulting Firm	PG&E, SCE and SDREO	Bank
Program Manager Qualifications					
Experience installing solar PV systems	X				
Experience in serving low-income populations	X	X		X	
Experience in developing marketing strategies directed at low-income communities	X	X		X	
Experience in creating finance packages for energy efficiency measures and/or solar energy systems	X	X			X
Knowledge of the needs of low-income, single-family homeowners	X	X	X	X	
Language ability for major language requirements of eligible low-income populations	X	X		X	
Knowledge of LIEE and CARE programs		X		X	
Experience with energy efficiency measures and energy audits at the residential level	X	X		X	
Widespread city and county government contacts throughout California	X				
Ability to create partnerships with private sector finance entities					X
Existing relationships with affordable housing and environmental groups	X	X	X		
Ability to deliver program through collaboration with multiple stakeholders (i.e., no preexisting constraints on partnering latitude)	X		X		X
Data gathering and analysis skills		X	X	X	X
Experience managing state solar or energy efficiency rebates	X	X		X	

4.4 Recommended Institutional Structure

Staff recommends that the CPUC outsource the administration of this program to one competent organization or agency, with appropriate oversight by CPUC staff. Staff reasoned that one Program Manager can more easily implement such a program consistently across the state and maximize the effectiveness of relationships with federal, state and local agencies and private finance entities than multiple administrators.

Staff recommends that this organization or agency must meet most or all of the qualifications detailed in Section 4.2. Staff also recommends that the chosen Program Manager already be providing services to low-income communities, be familiar with the needs of low-income communities, and have already established trustworthy relationships within these communities prior to implementing the CSI low-income incentive program. Administration costs will be capped at no more than 10 percent of this strategy's program budget, although proposed overhead costs could be even less. The RFP will assign scores to the range of overhead percentages in proposals for staff to use in determining winning proposals.

4.4.1 Process of Selection

The CPUC will direct one of the IOUs to issue a five-year RFP for the Program Manager according to the above criteria, qualifications, and experience, within three months of Commission approval of a final low-income incentive for single-family homes. CPUC Energy Division staff would participate in drafting the RFP. Prior to the IOU releasing a final RFP, Energy Division would issue a draft RFP for parties to the proceeding to provide comments. Energy Division staff would direct the IOU to make any necessary revisions to the RFP. CPUC Energy Division staff would also participate in reviewing and evaluating incoming proposals. Energy Division will select the Program Manager with input from the IOU. The CPUC will also direct the IOU to contract with the Program Manager within three months of the selection. The Commission would direct the utilities to establish accounts with the selected Program Manager to transfer ratepayer funding for the program to the Program Manager for its contract. The IOUs should work together to determine the most efficient means of paying both the Program Manager and incentives. Utilities would be compensated for their expenses for accounting and payment functions by an advice letter process.

The scope of the administration contract should be broad, specifying work to be performed by the Program Manager and deliverables. The list of significant topics to negotiate with the Program Manager may include: Attachment with Standard Terms and Conditions for State Contracts, i.e., wages, discrimination, tax laws, etc.; financial arrangements for PA subaccounts; necessary billing calculations and schedule for progress payments; Subcontracting; Conflict of Interest; Annual reports; Insurance, Warranties, Indemnification; Business reorganization; Termination Provisions. The contract will contain a right to terminate the contract for any reason, including but not limited to, performance concerns. CPUC staff will be expected to provide significant input into and oversight of the contract between the IOU and the Program Manager.

5. Evaluation

5.1 Evaluation Process

Staff proposes that the low-income incentive program is evaluated on an ongoing basis and in a formal biennial evaluation.

Ongoing Evaluation:

During program implementation, the administrator will evaluate the strengths and weakness of the program, and report to the CPUC on the progress of the program on a regular basis.

Biennial Evaluation:

The Commission will also measure the progress of the entire low-income incentive program through a second means, a biennial independent evaluation. Every two years, Energy Division will select an independent evaluator to review both the Program Manager and the incentive program against evaluation criteria. Working closely with the Energy Division, one IOU will issue an RFP for the evaluator. The IOU would collect evaluator proposals and together with Energy Division staff will review and evaluate proposals. Energy Division will select the evaluator with input from the IOU. The evaluator will rely on the following in its review: interviews with applicants and stakeholders, individual project progress reports provided by the Program Manager, prior program evaluation results, issues identified by Commission staff for further investigation and new information about technologies or the marketplace. If suggested in the evaluation, the Commission may consider directing the Program Manager to refocus program milestones and alter administrative processes.

5.2 Milestones and Evaluation Criteria

The low-income solar program should reach the following milestones:

1. Within 12 months, the CSI low-income incentive program will be implemented in PG&E, SCE and SDG&E territories.
2. By 2010, 1000 PV systems will be installed on low-income, single-family homes.
3. By 2010, 100% of the eligible population across the state within the 3 IOU territories will have been contacted about the low-income incentive program

The evaluation should include, but is not limited to, the following criteria:

- Number of households served
- Cost of program per household
- Overall cost of program
- The average amount energy bill is reduced per household
- Whether participating households perform an Energy Audit

- Other, non-solar energy saving measures households have implemented
- Whether or not the program increased household debt-load
- Customer satisfaction
- Turnover of homeowners in houses served and ongoing residence status of the home
- Languages used in outreach
- Value of power avoided
- Location of households served
- Location of eligible households not served
- Geographic coverage across the state
- Percent of CARE/LIEE customers served
- The effectiveness of consumer education programs on solar and energy efficiency
- Effectiveness of energy efficiency measures as related to PV systems
- System performance and maintenance concerns

Staff proposes that the M&E contractor draft an evaluation plan that the CPUC will issue for public comment. Staff will work with the Program Manager and evaluator to draft the plan.

The CPUC staff, Program Manager, and evaluator will rely upon CPUC evaluation protocols which are already established for the utility energy efficiency programs in the 2006-2008 funding cycle.

Specifically, we will draw upon evaluation protocols for:

- The “Impact Evaluation” protocols
- The “Process Evaluation” protocols

6. Questions for Comment

In addition to providing comments on other aspects of the staff proposal, staff asks for feedback on the following questions:

Program Requirements

1. Are there other incentive programs that can be used as a model?
2. Owner/occupant turnover on the house may result in a non-low-income owner of the PV system. To what extent is this a problem and how should staff address this risk?
3. Does the proposed program adequately incorporate energy-efficiency and other energy management strategies?
4. The proposal requires an applicant to take LIEE service within one year of receiving a solar incentive if eligible. How can the program ensure this?
5. The proposal requires that the maximum system size be based on an annual load estimate that reflects the deployment of certain cost-effective energy efficiency measures. How should the annual load impact of these energy efficiency measures be estimated?
6. Given LIEE lead times, is appropriate to require installation of LIEE measure within a year?
7. For non-LIEE eligible participants, are there additional approaches to incorporating energy efficiency and other energy management strategies into the program?

Incentive Structure

8. Is the proposed incentive structure the best option for the low-income strategy?
9. Should there be incentives which fully subsidize the PV system for certain households and/or for systems of a certain size?
10. Are the incentive levels too high for moderate income households?

11. How should the proposed incentive levels or structure be altered, if at all, to reflect the requirement that households receiving incentives under this program go on TOU rates? To the extent possible, stakeholders should provide economic analyses in their comments to justify proposed changes to the incentive levels, including consideration to such issues as climate zones, daytime electric profiles, etc.
12. Are the proposed incentive levels sufficient to motivate participation by the targeted population?
13. How likely is it that eligible households could obtain loans to help pay for the PV system? Is it realistic to assume a 25-year term for relatively small loans?
14. Are there alternative ways to categorize these incentive levels?
15. Are there other financing options we should consider?
16. What innovative means will further improve performance or reduce the costs of installations for these populations?

Program Administration

17. Is the staff proposal regarding who should administer the program acceptable? Should just one manager run the program?
18. Is this program apt to be successfully delivered within 12 months in the three IOU territories?
19. If the definition of low-income in AB 2723 is redefined to include CARE and LIEE participants, should the Commission consider program delivery through existing CARE/LIEE infrastructure?
20. Is the program budget per IOU appropriate? If not, what evidence supports a more appropriate split?
21. Are the proposed overhead costs for managing the program, marketing and outreach, and evaluation correct?
22. Are there additional models for administration that should be considered?

Program Evaluation

23. What metrics or outcomes would indicate that the program is “successful”?

Appendix A: Additional Low-Income Solar Programs

In late 2006, staff researched solar electric incentive and pilot programs in other states for reference in designing this strategy. While a number of states and utilities have attempted air/water heating initiatives in low income communities, few had PV programs, and staff found no information on PV incentive programs. A description of these efforts, by existing homes and then new or affordable homes strategies follows.

EXISTING HOMES

Arizona: PV

- NativeSUN, a project of the Hopi Foundation in Kykotsmovi, Arizona, has been installing PV systems since 1987.
- Purpose: to increase the awareness of Hopi and other indigenous peoples about renewable technologies and demonstrate a community's ability to sustain an ecologically healthy environment for the future and current generations.
- More than 200 PV systems installed on the Hopi and Navajo Reservations. It has extended its services to non-Indians and has placed PV systems near the communities of Flagstaff and Winslow, Arizona. Most customers use their systems for lighting, television, kitchen appliances and small power tools.
- The program has about \$250,000 to loan to potential customers.
- Average loan is \$6,000 at 12% interest over four years. The program offers senior citizens 62 years and older a discounted interest rate of 8%.
- NativeSUN operates an Energy Demonstration/Training Center that displays available technology, holds hands-on demonstrations on the environment and ecology, and works with the schools to educate the next generation.
- The project has begun to introduce other products that meet the needs of its rural clientele, such as composting toilets, solar water heaters and solar water pumping systems.

Pennsylvania

PBF: Water Heaters and PV:

- 1999: \$3.2 million of the PA PBF targets specific renewables applications in low-income homes, mostly solar hot water heaters and PV panels. Slightly less than half of this amount was spent on the water heaters. Funds were available January 1, 1999.
- PA Department of Energy's (the state Weatherization Assistance Program grantee) Leveraging Project negotiated commitments to have the programs operated by either community-based organizations with relevant technical experience and a history of working with the utilities, or by Pennsylvania Weatherization Task Force member agencies, who currently administer weatherization. Another agreement allows for CBOs to participate through an RFP process. A utility commission order directs utilities and other parties to the settlements, including the Task Force, to take steps to design and implement these settlement agreements.

NEW/AFFORDABLE HOMES

Pennsylvania: PV

- 2004: PECO had a \$500,000 fund for solar power installation in low-income housing in Philadelphia.
- PECO Energy funded \$232,100 to the Philadelphia Housing Authority (PHA) for installation of photovoltaic solar energy systems at 22 homes in the new Grays Ferry Estates (an affordable housing development) in Southwest Philadelphia and the Lucien E. Blackwell Homes in West Philadelphia.
- 18 of the 22 solar energy units were to be installed on south-facing homes at Gray's Ferry. 4 units will be installed at the Blackwell Homes.
- The Housing Authority estimates that residents using the solar systems would save \$400 to \$500 yearly in energy costs, or as much as 25 percent of the energy costs a year.
- Six 185-watt solar panels were to be mounted on each roof and connected to the home's electrical system. Each installation was expected to produce 1,630 kWh/yr.
- PECO's initial grant of \$88,000 to the Norris Square Civic Association in December 2002 supported the installation of eight systems in North Philadelphia.
- Grant was made through PECO's Universal Services program, which provides usage reduction and utility financial assistance to more than 125,000 low-income households throughout the company's service area.

Washington: SWH & PV

- 2006: 1 demonstration project on Lopez Island, Washington by A World Institute for a Sustainable Humanity (A W.I.S.H): small footprint low income clustered housing zero net energy initiative (up to 14 units) that will have solar energy as a key component for PV and solar hot water heating.

Ohio: PV if at all

- May have a loan/grant fund that consumers can access that has funded some PV and thermal projects, but unclear on program design.

Pennsylvania: SWH & PV

Solar Training conducted by FSEC:

- September 1999: FSEC staff trained weatherization staff in two five-day interactive training programs involving hands-on experience with state-of-the-art PV systems and solar water heating systems. 70 staffers were trained in solar site selection and 37 in installation of PV systems and solar water heaters.
- The training was sponsored by the Pennsylvania Weatherization Providers Task Force, the Pennsylvania Department of Community and Economic Development, the WAP grantee; and Penn College Technology Transfer Center.

(END OF APPENDIX A)