**BEFORE THE PUBLIC UTILITIES COMMISSION**
**OF THE STATE OF CALIFORNIA**

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| Order Instituting Rulemaking Regarding Policies, Procedures and Rules for the California Solar Initiative, the Self-Generation Incentive Program and Other Distributed Generation Issues. | RULEMAKING 06-03-004 (Filed March 2, 2006) |

# COMMENTS OF CALIFORNIANS FOR RENEWABLE ENERGY, INC. (CARE) RELATED TO THE ROLE OF AFFORDABLE HOUSING IN THE CEC'S NEW SOLAR HOMES PARTNERSHIP AND THE CPUC'S CALIFORNIA SOLAR INITIATIVE

## I. INTRODUCTION

On June 12, 2006, the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC) held a joint workshop on the Design of the New Solar Homes Partnership. On June 13, 2006, the CEC and the CPUC held a joint workshop to discuss the role of affordable housing (AH) in the CEC's New Solar Homes Partnership and the CPUC's California Solar Initiative (CSI). CAlifornian's for Renewable Energy (CARE) respectfully submits the following comments in response to the highly informative presentations and subsequent discussion.

## II. SOLAR SUBSIDIES FOR AFFORDABLE HOUSING OWNERS AND DEVELOPERS MUST OVERCOME EXTREME UP-FRONT CAPITAL COST BARRIERS

At the outset of the June 13, 2006 workshop, the CPUC presentation queried whether long-term, performance-based incentives (PBI) will work for AH solar projects. Specifically, the CPUC must answer whether owners of existing AH properties will adequately benefit from a 5-year schedule of payments based on performance of the systems installed on their AH developments.

In short, the 5-year, PBI structure will not provide adequate incentives to pull existing AH owners into the solar market. The PBI structure envisions that the AH owner either pay up-front the entire cost of the solar system or locate 100% of the necessary financing. As we all heard repeatedly during the workshop, however, AH developers and owners operate on extremely tight budgets and do not generally have the financial flexibility to fund a large-scale improvement or upgrade in hopes of reaping benefits five years in the future.

What then is to be done to encourage AH owners and developers to dive into the solar market with such limited resources as their disposal?

### A. CPUC SHOULD MODIFY SUBSIDY LEVEL TRIGGERS

First, the CSI should create an alternative methodology for ratcheting down subsidies for the AH component of the program. If the AH component is set up like the rest of the CSI incentives, rebates will decrease as more solar is installed. Because AH budgets are so constrained, however, decreasing the incentives with no parallel decrease in price will quickly price AH owners out of the market. Thus, as was suggested at the workshop, subsidies for AH should be pegged to solar panel prices to ensure on-going, robust participation by AH owners and developers throughout the program's entire 10-year duration.

### B. CPUC SHOULD EMPLOY AN EPBI/PBI HYBRID PAYMENT STRUCTURE

The CPUC should pay 80% of the expected performance based incentive (EPBI) and then pay out the additional 20% on a 1-year PBI schedule if the system actually performs as expected. Such a compromise would provide AH owners up-front assistance by giving them most of the incentive soon after the cost is incurred. At the same time, the 20% holdback would allow the CPUC to continue to raise the standards regarding proper installation by holding parties accountable for actual performance of the installed system.[1]

### C. ALTERNATIVELY, CPUC SHOULD PROVIDE SUBSIDIZED FINANCING, NOT DIRECT REBATES, TO AH OWNERS AND DEVELOPERS

Creating a low-interest financing plan presents an entirely different approach to solving the up-front cash flow problem that most AH owners and developers will predictably face when considering whether to participate in the CSI program. Using the AH portion of the CSI money for subsidized financing will allow more AH owners to participate in the program because the CSI money would only go towards holding down interest rates. Additionally, low-cost loans to AH owners are less risky than they would be in the open market, because AH owners are often committed to projects for long periods of time and are intimately familiar with financing and loan repayment requirements.

Subsidized financing could be created in existing credit union institutions. Such a plan would require partnership between the state and the credit union(s). The credit

[1] CARE would also like to take this opportunity to suggest the 80%/20% payout structure for consideration throughout the CSI program. This hybrid EPBI/PBI gives the solar investor the majority of the rebate money at the outset to cut down financing costs, but allows the CPUC to increase performance by linking the remainder 20% to actual output.

union(s) would administer the lending activities, while the state would pay down interest rates for the borrowers. From the AH owners' perspective, the low-interest loan would allow the owner to purchase the solar system and then pay off the loan with the saving received from utility cost reductions.

In addition, this program could include the option of a small, future low interest loan in case AH owner needed to repair or otherwise maintain his or her solar system. Such a loan would ensure that the solar system would, in fact, pay for itself through real saving on utilities.

Although commercial banks might also be willing to partner with the state to create these subsidized low-interest loans, CARE would prefer that administration of the program involve only non-profit institutions. CSI's primary goal is to get as many effective solar panel operational in California as possible. The excessive administration fees and charges often charged by for-profit institutions will inhibit CPUC's achievement of that goal.

### D. COMBINATION OF DIRECT REBATES AND LOW-INTEREST LOANS

Finally, the CPUC could present AH owners with a combination of both the 80%/20% PBI rebates (perhaps based on a lower direct rebate level) coupled with low-interest financing for the rest of the project cost.

### E. SPEEDY PROCESSING OF RESERVATIONS AND REBATE PAYMENTS, NO MATTER WHAT THE FORM, WILL FACILITATE AH INVESTORS' PARTICIPATION IN CSI

After listening to the presentations by AH developers and operators, CARE quickly notes the importance of quick processing of reservations and rebate payments. AH developers and owners operate under extreme time and finance-related pressures. Quick processing times by both the CEC and the CPUC will help to ensure those contemplating an investment in solar for their AH projects will not forego the opportunity based on a fear that authorization and payment will be untimely.

## III. APPROPRIATE CHOICE OF AGENCY FOR AH SOLAR INCENTIVE PROGRAMS

CARE recommends that new inclusionary and single unit AH installations be placed under the CEC program, and that larger systems which can take advantage of financing and the commercial tax credit be under the jurisdiction of the CPUC, as the profiles of each align themselves more readily with the program guidelines for the two programs.

Alternatively, CARE suggests that all AH programs be consolidated under one agency. The continued split nature of solar incentive programs adds confusion, unnecessary bureaucracy, and additional cost to the administration of these critically important programs.

## IV. ENERGY EFFICIENCY RATING OF AT LEAST 35% ABOVE TITLE 24 SHOULD BE REQUIRED OF ALL NEW AH CONSTRUCTION PROJECTS

In all new, AH construction projects that will be deploying PV panels under the incentive programs, the state should require a minimum energy efficiency rating of 35% above Title 24 required levels. Increased energy efficiency measures will allow for fewer PV panels for each installation. The combination of 35% EE over Title 24 and the reduced number of PV panels will result in much lower expenses and increased savings for the AH developer.

## V. NEW AH CONSTRUCTION PROJECTS SHOULD INCLUDE PROVISIONS FOR INCREASING THE SIZE OF THE STANDARD SOLAR SYSTEM SIZE BEYOND CAPACITY OFFERED

If a standard one KWh is offered in a new home development, provision must be made for a homeowner to purchase a larger system. There should be flexibility in the state's incentive program for this expansion to occur either in the construction phase. Even after construction, the customer should be allowed to use retrofit rebate funds to increase system size. In the Sevenhills Development in Livermore, where 1.1 KW systems were offered with each home, two owners' added panels to achieve adequate systems to reduce their bills to, in one documented case, $4 per month. Although solar reduces the top tier of electric bills on the 1.1 KW installations, the customers are still subject to rising rates on the major portion of their electrical usage. Some customers in a new homes development will wish to have more solar as a hedge against rising electrical rates. This should be available to them.

## VI. TECHNICAL CONSIDERATIONS RELATED TO INSTALLATION OF EFFECTIVE PV SYSTEMS[2]

### a. SOUTHWEST PANEL ORIENTATION PROVIDES BALANCED BENEFITS IN BOTH SOLAR PRODUCTION LEVELS AND PEAK SHAVING

Orientation of PV panels plays a key part in the effectiveness of the solar systems both in terms of sun exposure an in terms of reducing peak demands. Southwest panel orientation increases solar production during the midday (over west-facing panels), while

[2] The following technical considerations are applicable equally to AH installations as they are to general considerations in the structure of the general CSI incentive program.

still contributing to peak shaving effects. Careful consideration of panel orientation will maximize benefits to both the producer and the state's energy infrastructure.

West-facing panels do not maximize overall solar benefits. For most of the year, PV panels facing due west do not capture much valuable production around midday and early afternoon. A west-facing system will give maximum benefit only during a few days around the solstice. Thus, west-facing panels do not maximize production.

Also, west-facing panels also do not provide peak-shaving benefits at the levels that California has experienced in previous years. Heavy electrical usage begins in PGE territory during the noon hour, but then continues to escalate throughout the afternoon. Peak hours can be as late as 6:30 p.m. due to increased activity by Californians in the early evening hours. The sun in most areas of California is low on the horizon by then, and solar production becomes extremely limited. In the wintertime, West facing panels lose considerably more sun hours because of earlier sunsets. Thus, peak shaving benefits have been reduced by later peak hours, reducing the rationale for west-facing panels.

Maximum effectiveness of solar panel installation is preferably southwest both in terms of customer production levels and contribution to peak shaving. Southwest orientation captures much more of the midday and early afternoon sun for production purposes, and at the same time, contributes to the energy production during peak periods to the extent that solar power will continue to provide peak shaving benefits.

Thus, placing PV on all new homes in a development, regardless of roof orientation, may not be using the rate payer rebates to best advantage. Careful selection of orientation and a rebate structure crafted around high performance for each installation – with the recognition that southwest orientation balances both production and peak shaving benefits – will allow the state to maximize the CSI benefits.

### b. PANEL PERFORMANCE IN HIGH HEAT LOCATIONS

In the design of the EPBI (Estimated Performance Based Incentives), it is extremely important that the ambient temperature and location of the region be taken into account when estimating the performance of BIPV and other non-integrated PV on New Homes such as flat-jack installations, which do allow for air circulation. Ryan Wiser et al. in "Suppporting Photovoltaics in Market-Rate Residential New Homes published by Lawrence Berkeley Laboratory states in a footnote on page 1 that BIPV panels are affected by heat and subject to performance loss (eetd.lbl.gov/EA/EMS/reports/5929 pdf). The International Energy Agency IEA PVPS Task 2 "Understanding Temperature Effects on PV System Performance" states the following: "Sloped Roof, highly integrated...there is little air circulation inside the building in the roof area. The maximum measured module temperature was 85 degrees C and the mean rise in temperature from ambient is about 55 K at 1000 W/$m^2$. This results in a loss of 10.3%." (www.iea.org) Although an area such as Palm Springs has a higher value in sunlight, the hot temperatures of over 100 degrees Fahrenheit reduce the effective output of the panels by .38 % for every degree over 70 degrees Fahrenheit. (Graham Owen, www.gosolar.com) Because there are

innovations, such as Suntile from Sunpower Corporation, which uses concentrator cells designed to handle greater heat, or in some cases such as Sanyo's double sided panel designed to take advantage of extra heat generated, there need to be specifications for individual products factored into the EPBI calculations.

### c. MAINTENANCE EDUCATION AND CONTINUED AFTERCARE PACKAGE FOR PV SYSTEM OWNERS

The developer/installer of any PV system must provide a maintenance program for the customer. This includes information about timely maintenance for the inverter, and expectation that the inverter will have to be replaced after a certain number of years of service, depending upon the individual manufacturer. Inverters require periodic maintenance in order to maintain their warranty, and depending upon the manufacturer, can last up to ten years before needing to be replaced. Panels should be cleaned to prevent dust from degrading the performance output, most particularly if the panels are not exposed to rain with frequency. PV Panels cannot be compared to standardized new home options such as granite counter tops. They require education on the part of the homeowner, as they are an electrical delivery system which mandate they be maintained in order to continue performing at their maximum potential.

### d. REMOTE MONITORING AND POOLED METERING

All systems should have remote metering capabilities which enable the home or business owner to monitor the PV system so that should there be any failure, such failure can be corrected quickly. These monitoring systems are currently available through companies such as Fat Spaniel, SPG Solar, and Powerlight. Also, many inverter companies are now offering customer friendly meters.

Related specifically to multi-home projects, including many AH housing projects, pooled metering must be considered by both incentive programs to decrease overall cost to all residents. Such a decrease will shrink capital repayment periods on these multi-family solar projects and thus will increase the number of financial options at the outset. Pooled metering maximizes the benefits for all residents and provides the highest overall economic benefit for all residents.

## VII. CARE REITERATES ITS CALL FOR STRENGTHENING NET METERING REQUIREMENTS AND EQUALIZING DG SOLAR PRODUCTION PRICES WITH OTHER ENERGY SUPPLIERS

CARE wishes to reiterate its position that favorable net metering conditions will spark an exponential growth in solar. Thus, a reworking of the net metering program as it is today – whether directly in the present CSI proceeding or through related rulemaking or by lobbying for changes at the legislative level – should be a key goal of the CSI program. The continued uncertainty surrounding the potential economic benefits of owning solar panels will weigh heavily on the solar market until DG suppliers' rights to fair compensation are clearly defined and permanent. Fair compensation, from CARE's

perspective, includes payments or credits equal to or above rates given to other energy suppliers.

Dated: June 20, 2006

Respectfully submitted,

/s/

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**Certificate of Service**

To reduce the burden of service in this proceeding, the Commission will allow the use of electronic service, to the extent possible using the electronic service protocols provided in this proceeding. All individuals on the service list should provide electronic mail addresses. The Commission and other parties will assume a party consents to electronic service unless the party indicates otherwise.

I hereby certify that I have this day served the foregoing document "**COMMENTS OF CALIFORNIANS FOR RENEWABLE ENERGY, INC. (CARE) RELATED TO THE ROLE OF AFFORDABLE HOUSING IN THE CEC'S NEW SOLAR HOMES PARTNERSHIP AND THE CPUC'S CALIFORNIA SOLAR INITIATIVE**" for the proceeding RULEMAKING 06-03-004 along with eight copies upon the Commission dockets office. Each person designated on the official service list has been served via e-mail, to all persons on the attached service list on June 20, 2006 for the proceeding RULEMAKING 06-03-004.

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