

From: Sandy Miller
To: Docket Optical System
Date: 11/9/2006 7:33:13 AM
Subject: Fwd: DOE Comments on CEC & CPUC Guidebook/Handbook

Hi docket, Please docket the email message and attachment to the NSHP docket:
 06-NSHP-1

Thanks, Sandy Miller

>>> <Craig.Cornelius@ee.doe.gov> 11/08/06 3:15 PM >>>

Dear Sandy, Kurt, and others,

Thank you to all for providing us with an opportunity to comment on the guidebooks that you have developed for implementation of the California Solar Initiative. We are extremely impressed by the rationale behind the programs as designed by the CEC and CPUC, and by the comprehensiveness of the guidebooks developed to implement them.

The attached document includes our primary observations about the guidebooks. Our comments are organized around two areas -- (1) Determining system size and incentives; and (2) Metering and communications requirements. In the former area, many of the clarifications that we suggested will hopefully be addressed through the calculators -- and we would welcome the opportunity to help with the testing/validation of those calculators. In the latter area, we have provided some suggestions about the requirements for hardware that will be used to support system metering/monitoring.

Thanks again for the opportunity to be involved. Please let us know how we can contribute further.

/R
 Craig

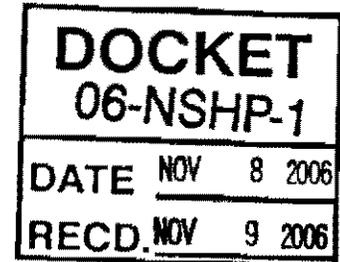
(See attached file: DOE Comments on CPUC-CEC Handbooks.doc)

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Miller" <Smiller@energy.state.ca.us>
Subject: DOE's offer to review CEC's NSHP guidebook

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Craig,

It was great connecting with you by conference call when you were visiting our CPUC colleagues. Please find attached our NSHP guidebook. Thank you for your willingness to provide informal comments regarding our NSHP guidebook. You can direct those comments to Sandy Miller smiller@energy.state.ca.us. We will need written comments by November 7th, 2006. You can also see our workshop notice and guidebook at: <http://www.energy.ca.gov/renewables/06-NSHP-1/documents/index.html>

I also welcome you to visit the one stop single web portal that we have recently launched combining CPUC and CEC program and other energy news at: <http://www.gosolarcalifornia.ca.gov/>

Best,

Payam Narvand
Program Lead
Renewables Office
916-654-4017

TO: California Public Utilities Commission, California Energy Commission
FROM: DOE Solar Energy Technologies Program
RE: (1) Draft California Solar Initiative Program Handbook, dated October 19, 2006; and (2)
CEC New Solar Homes Partnership Committee Draft Guidebook

Personnel at the U.S. Department of Energy (DOE) have reviewed the subject draft handbooks and respectfully submit the following comments and suggestions. In an earlier letter, addressed to the Administrative Law Judge (dated August 10, 2006) I identified several areas for possible technical collaboration between DOE and CPUC/CEC in support of a successful California Solar Initiative. These collaborative opportunities still apply, and I refer you to this earlier correspondence for further details. I will be happy to discuss these at your convenience.

As we stated in our earlier correspondence, DOE commends and strongly supports the progressive direction of the California Solar Initiative (CSI), with its reasonable mix of performance-based incentives (PBI) and expected performance-based buy-downs (EPBB). By focusing on incentives for the energy produced by installed PV systems, CSI is pushing the photovoltaic industry toward new standards of quality in manufacturing, integration, installation, and maintenance, which will lead to increased energy security for our nation. California is truly leading the way for broader PV markets on a nationwide basis.

In addition, the inclusive and collaborative process by which the details of the CSI have been developed has led to thoughtful and thorough development of a comprehensive program. The administrative steps within the documents are clear, as are the rationale behind these steps. The methods devised for assuring long-term performance, which include inspection schedules (random for statistical samples of smaller systems), requirements for metering and monitoring, and 10-year warranties on installed systems, are all reasonable and do not overburden the customers or the system suppliers.

The comments below were developed by our staff at DOE headquarters and staff at the National Renewable Energy Laboratory and Sandia National Laboratories. Regarding specific feedback to the technical details incorporated in these documents, we wish to address two areas: the determination of the system size and the corresponding incentive levels, and the process of metering and monitoring performance of installed systems. For each of these technical areas, we have comments specific to each guidebook/handbook, discussed below.

Determining System Size and Incentive Levels

Our primary concern is that, in either program, more information is needed for an applicant to effectively perform his or her own calculations to estimate the payback incentive level for a given system under consideration. Since these calculations are important to determine both the level of incentive to be applied to a particular system, and also to determine the contribution of each system toward MW targets (and incentive step levels), we feel that further detail on performing these calculations is warranted. Although it's clear that CPUC and CEC are working on further defining the process for these calculations, it is not clear that more information is to be included in these documents. If that's the case, then easy access should be provided, most likely

through on-line access to appropriate calculators and forms.

Specific to CSI Program Handbook

We see that each full application requires submittal of both "electrical system sizing documentation" and "incentive calculation worksheet" (Section 4.7). Perhaps the required forms themselves are straightforward and adequately walk an applicant through the process; not having seen them, we cannot make such a determination. We therefore offer some comments about what is included in the handbook.

The equation on page 2-6 shows the calculation of "system size," by which one can refer to Table 4 (p.1-4) to determine the PBI or the EPBB. However, this equation merits further explanation. For instance, "quantity" likely refers to the number of modules connected to a single inverter, but is not stated clearly. In addition, the "CEC Rating of Photovoltaic Modules" and the "CEC Inverter Efficiency Rating" should be made available to applicants. Are these available on the CEC website? If so, then we recommend clearly stating this. If not, then we recommend providing a means of obtaining or determining these values.

Similarly, the Design Factor on p.2-6 is described, but not in sufficient detail for an applicant to calculate it for a specific system. The glossary at the end of the document offers some clarification, in that this is a ratio of expected output between the proposed system and a baseline system (perhaps this should be stated in the body of the document). We recommend either providing a section that gives details of calculating this design factor, or providing a link to a web site with further guidance.

Specific to NSHP Guidebook

The methodology appears to be straightforward, including the use of time-dependent valuation of the produced energy. It is difficult, however, to provide much in the way of substantive feedback here without practical use of the PV Calculator. As stated above, these calculations will be critical to applicants, so the more guidance and documentation that CEC can provide on these calculations, the better. This includes further detail on the "California flexible installation criteria." Thus, an understanding of the calculations behind the generation of form CF-1R-PV will be of importance to applicants.

Metering and Communication Requirements

We applaud the level of detail given to metering and communication requirements for PV systems installed through CSI. It is our opinion that such requirements will drive the industry toward better accountability of system performance, through improved accuracy of inverter meters, considerations for more integrated monitoring and data acquisition systems, and integrated communications for continuous state-of-health monitoring of functional PV systems.

Along this line, we wish to reiterate our interest in technical collaboration related to the development of fully-integrated PV systems that contain metering, monitoring, and communications functions. Rather than the current practice of including add-on componentry, we envision a PV system of the near-future with modules that communicate real-time operational characteristics to the inverter, and vice versa. The inverter will evolve into an overall system controller, and will communicate with other local PV systems to become a "smart" generator

over a broader region. This smart generator will then interface with the utility and with local loads (and storage) to improve the efficiency of electricity delivery and further offset peak demand. Also imbedded in this integrated functionality will be continuous state-of-health monitoring and self-diagnostics, all of which will contribute to increases in overall capacity factors of installed PV systems. To drive this transition, we'll need requirements, specifications, and broad markets for new products. We see the current requirements of CSI as a crucial first step to this type of revolutionary shift in the PV industry.

Specific to CSI Program Handbook

We have only two questions, for which you may wish to provide further clarification. In Section 11.2, "Minimum Communication Requirements," it states that systems greater than 20kW "should" have remote communicating capability. Is this a firm requirement? Additionally, in Section 11.4, the Performance Monitoring and Reporting System is to be provided and administered by an independent entity. This cost, however, is not included in the description of "Total Eligible Project Costs" (Section 10.1). The cost of monitoring equipment is included, but not the cost of administering this equipment or any kind of data manipulation or analysis. Is this an oversight?

Specific to NSHP Guidebook

Since the NSHP applies only to smaller systems (up to 5kW), the metering requirements are simpler than for the CSI in general. We believe these requirements are reasonable. In addition, the Energy Commission makes no statements regarding communications. Although reasonable, we encourage the Energy Commission to consider applying some of the R&D set-aside to explore potential opportunities and benefits of remote communications among residential-sized PV systems, in aspects of state-of-health monitoring, establishing micro-grids, and improving time-of-use aspects of PV generation for peak shaving and intelligent load management.

In conclusion, the California Solar Initiative is clearly an exciting opportunity for our nation's PV industry. We are eager to assist CPUC and CEC in assuring the success of CSI, and in seizing the many opportunities that CSI will offer in terms of technology development, new system integrations, and the market transformation that will inevitably result from the State of California's aggressive, long-term commitment to the future of U.S. photovoltaic technology.

Sincerely,

DOE Solar Energy Technologies Program