

Decision 07-08-007 August 23, 2007

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Regarding Policies,
Procedures and Rules for California Solar
Initiative, the Self-Generation Incentive Program
and Other Distributed Generation Issues.

Rulemaking 06-03-004
(Filed March 2, 2006)

**OPINION MODIFYING DECISION (D.) 06-08-028 AND D.06-12-033
REGARDING BUILDING INTEGRATED PHOTOVOLTAIC SYSTEMS
AND THE INCENTIVE ADJUSTMENT MECHANISM**

1. Summary

We modify two decisions implementing the California Solar Initiative, D.06-08-028 and D.06-12-033, to include building integrated photovoltaic (BIPV) systems with other photovoltaic systems that receive incentive payments based on expected performance, rather than based on actual installed performance. Newly-available performance information from the California Energy Commission (CEC) enables us to now include BIPV systems with other photovoltaic systems in our up-front solar incentive program, the Expected Performance Based Buydown (EPBB).¹

¹ Our incentive payment is based on an algorithm that requires several data inputs. Certain of these inputs require modification to accommodate the new data from the CEC. Our staff is currently working in collaboration with the CEC and the program administrators to develop the modifications. In today's decision, we direct the program administrators to file and serve a compliance report setting forth the specific modifications necessary.

2. Background

2.1. Building Integrated Photovoltaic Systems and the Two Incentive Payment Systems

In D.06-08-028, the Commission established two distinct incentive payment mechanisms to encourage customers to install solar electrical generation systems:

1. Expected Performance Based Buydown (EPBB), which provides for a one-time, up-front payment for eligible systems. The payment amount is calculated using a system rating multiplied by a design factor and the current incentive level adopted in D.06-08-028 and D.06-12-033.²
2. Performance Based Incentive (PBI), provides monthly payments to eligible systems based on actual system output over a five year period, with payments made on a per kilowatt hour (kWh) basis, using metered data.

In D.06-08-028 and D.06-12-033, we established a schedule of incentive payments based on a target schedule of megawatts per administrator. In addition, we defined the system characteristics that determine whether a system receives the upfront, EPBB incentive payments or receives payments on a per kWh basis under the PBI. The Commission determined that systems of less than 100 kW are eligible to receive incentives under the upfront EPBB payment, while larger systems can only receive incentives under the PBI. The maximum system size that is eligible for EPBB payments decreases to 50 kW in 2008 and to 30 kW in 2010. However, any system may opt-into the PBI, provided the associated requirements are met.

² The payment amount declines in steps corresponding to the total megawatts of installed customer-sited solar in California.

In addressing BIPV systems, the Commission was unable to conclude that an accurate system rating was available to enable calculation of the upfront payment incentive and, accordingly, these systems were limited to PBI incentive payments, irrespective of other characteristics that would otherwise qualify them for EPBB incentives. These systems, unlike traditional photovoltaic systems, can be incorporated into the roof material and may not be cooled by air circulation under the units. Consequently, higher temperatures could reduce system efficiency and result in lower wattage output. At the time, this Commission issued D.06-08-028, the CEC had not tested new performance rating systems on BIPV products. Therefore, we could not ensure an accurate calculation of the upfront EPBB incentive payment.

2.2. Petition for Modification

On March 1, 2007, Open Energy Corporation filed a Petition for Modification of D.06-08-028 and requested that the Commission modify the decision to allow BIPV systems to be eligible for the upfront incentive payment under the EPBB. Open Energy stated that the CEC³ had recently adopted BIPV performance characteristics as part of its New Solar Homes Partnership (NSHP), which would provide the needed system rating standards to enable these systems to become eligible for upfront incentive payments under the EPBB.

In response to an Administrative Law Judge's (ALJ) ruling directing it to supplement its petition, Open Energy submitted a filing setting forth how the

³ Open Energy also filed a motion on March 1, 2007, for official notice of the CEC's New Solar Homes Partnership Final Guidebook (December 2006), Appendix 3 – Criteria for Testing, Certification and Listing of Eligible Components. The proffered document includes performance standards for photovoltaic systems, including building integrated systems. This unopposed motion is granted.

CEC rating data could be incorporated into this Commission's incentive payment methodology. Open Energy stated that the CEC data showed verified values for BIPV systems operating at higher temperatures, and that this data should be incorporated into this Commission's methodology for calculating upfront incentive payments. Open Energy concluded that the Commission should modify its earlier decision and allow building-integrated photovoltaic systems to be eligible for upfront incentive payments, retroactively effective to the date of the earlier decision. Thus, if an application has already been submitted for a BIPV system and is otherwise eligible, the applicant would be allowed to opt into EPBB. Open Energy indicates that absent this approach "applicants may simply terminate prior applications and resubmit new applications," resulting in duplicative administrative costs.

2.3. Responses to the Petition to Modify

The Joint Solar Parties,⁴ Californians for Renewable Energy (CARE), the San Diego Regional Energy Office (SDREO),⁵ Americans for Solar Power (ASPV), Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE) and San Diego Gas & Electric Company (SDG&E) filed timely responses, and generally did not oppose allowing BIPV technologies to receive upfront incentives under the EPBB, provided CEC certified system ratings are available.

⁴ Comprised of PV Now and the California Solar Energy Industries Association (CAL SEIA).

⁵ Now called the California Center for Sustainable Energy (CCSE).

The Joint Solar Parties supported Open Energy's Petition to allow all BIPV products to receive EPBB incentives if eligible based on their size, because many BIPV components have received certification by the CEC.

ASpv supported the Petition but only where the EPBB calculator is capable of providing a reliable prediction of system performance. SDREO supported Open Energy's request to allow BIPV products and to make the decision apply retroactively. SDREO also asserted that all BIPV products should be allowed, whether crystalline or thin-film.

PG&E supported the petition, but noted that BIPV should conform to the decreasing eligibility requirements for EPBB and PBI based on system size. PG&E suggested that should the Commission grant the relief requested in the Petition, conforming changes should also be made in D.06-12-033 Appendix B that modifies D.06-12-033 Ordering Paragraph 5.

SCE agreed with Open Energy that monofacial BIPV systems, such as those using tiles or shingles, could be treated similarly to solar panels by the EPBB incentive calculation methodology, so long as they are CEC-certified. SCE disagreed, however, that bifacial systems could also be included because performance has not been tested under "real conditions."

SDG&E did not oppose Open Energy's petition, but made its support for the proposed change conditional on the Commission's calculator being modified by the program administrators and contractor to reflect performance differences based on air gaps under BIPV products. Like PG&E, SDG&E noted that BIPV should conform to the general EPBB or PBI size eligibility and transition schedules.

CARE supported Open Energy's petition but asserted that the EPBB calculator should reflect "true expected performance."

2.4. Discussion

Pursuant to Rule 16.4 of the Commission's Rules of Practice and Procedure, a petition for modification must concisely state the justification for the requested relief, and must be supported by record evidence or matters that can be officially noticed.

In D.06-08-028, we determined that BIPV systems were ineligible for the upfront EPBB payment because no accurate system rating yet existed to evaluate the likely performance characteristics of these systems, although we provided that we would reconsider this restriction if reliable ratings become available at a later date. At the time D.06-08-028 was adopted, the information available to the Commission indicated that no CEC system ratings were available for these systems, and thus it was appropriate, at that time, to require these systems to take incentives under PBI.

Open Energy contends that new data from the CEC provides sufficient performance information to enable calculation of an upfront incentive payment for BIPV systems. No party has presented evidence disputing this contention, although several have expressed concern with calculation details.

We agree with Open Energy that the blanket prohibition on BIPV systems from the EPBB incentive is no longer appropriate. We will, therefore, grant Open Energy's petition for modification and allow systems that use BIPV products that are on either CEC eligible technology list⁶ to participate under the EPBB provided the system meets all other eligibility requirements.

⁶ The CEC maintains two eligible technology lists: one for the CSI program and one for the NSHP program. Relevant to this discussion, products on the NSHP list have

Footnote continued on next page

Further, we will modify D.06-08-028 to limit the exclusion from EPBB to technologies for which no CEC-certified system rating is available, since it is the availability of this rating information that determines if an upfront incentive can be calculated. By thus modifying D.06-08-028, we will ensure that as CEC ratings become available for other technologies, these technologies will be able to receive upfront incentives, provided they meet the other eligibility requirements.

We will also modify D.06-12-033 Appendix B that modifies D.06-08-028 Ordering Paragraph 5. However, as several parties note, we must develop a way to incorporate the CEC data on BIPV performance into our incentive calculation methodology.

The Commission's Energy Division has been collaborating with the CEC staff and believes that it has developed a reliable methodology that can be incorporated swiftly into the calculator. An outline of the contemplated revisions to the methodology is set out in Attachment 1.⁷ We will direct that the Energy Division continue its work on this methodology with the CEC's staff and the program administrators. When completed, the program administrators will file with the Docket Office and serve on the service list to this proceeding, a compliance report that explains the revised methodology and expected changes to the calculator. Absent compelling need, we expect the compliance filing within 30 days of the effective date of this order.

manufacturer-submitted actual performance data on a range of new CEC-required factors, such as nominal operating cell temperature and temperature coefficient data.

⁷ Building integrated photovoltaic cells receive less air circulation than panels mounted with full ventilation, so they operate at higher temperatures and produce less energy. The adjustments set out in Attachment 1 modify the Commission's calculator to reflect reduced energy output.

We deny, however, Open Energy's request to make this change retroactively effective. The California Solar Initiative is a dynamic, fast-paced program with incentives that decline as volume builds. Allowing existing program participants to change from one incentive system to another would create substantial administrative confusion and burden. Furthermore, the rules of the program at the time existing program participants filed their applications were clear: prior to the effective date of this order, all BIPV technologies were required to participate under the PBI. Retroactive application of changes in program rules generally sets a bad precedent that would encourage applicants to reserve megawatts which they intend to actually install only if certain rule changes are made. We do not wish to set such a precedent here.

3. Comments on Proposed Decision

The proposed decision of Commissioner Michael R. Peevey in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and Rule 14.2(a) of the Commission's Rules of Practice and Procedure. PG&E and SCE filed timely comments to the proposed decision. We make no substantive changes to the proposed decision but make minor changes to correct typographical errors.

4. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner in this proceeding and Dorothy Duda is the assigned Administrative Law Judge in this portion of this proceeding.

Findings of Fact

1. The CEC has adopted system rating methodologies for BIPV systems and received actual performance data for many BIPV products.

2. The CEC data will enable calculation of an upfront, EPBB incentive payment for BIPV systems, as with traditional panel-mounted systems.
3. As the CEC adopts system rating standards for new solar technologies, these systems should become eligible for upfront EBPP incentives.
4. Retroactive changes in incentive program eligibility will create confusion and administrative expense and complexity.

Conclusions of Law

1. To the extent enabled by the new CEC data, BIPV systems should be treated the same as traditional systems for purposes of the solar incentive programs.
2. D.06-08-028 and D.06-12-033 should be modified to allow BIPV systems to receive the same solar incentive options as traditional systems.
3. Open Energy's March 1, 2007 motion for official notice of the document referenced in footnote 3 of this decision should be granted.
4. This decision should not be effective retroactively, but should be effective immediately.

O R D E R

IT IS ORDERED that:

1. Decisions (D.) 06-08-028 and D.06-12-033 are modified to delete the exclusion of otherwise eligible Building Integrated Photovoltaic systems from the Expected Performance-Based Buydown Incentive and to exclude only those solar technologies that are not listed on the eligible equipment list of the California Energy Commission (CEC) as set forth below: (New text is shown in underline and deleted text in ~~striketrough~~.)

D.06-08-028

- a. Finding of Fact 13 - System ratings are not yet capable of estimating output for newer solar technologies, such as ~~building integrated PV and~~ bifacial modules.
- b. ~~Conclusion of Law 10 — All sizes of building integrated PV systems, even those on new construction, should receive PBI payments because it is difficult to estimate performance for these systems.~~
- c. Conclusion of Law 11 - New construction projects ~~other than BIPV~~, regardless of size, are exempt from PBI and should be paid up-front incentives to allow financing of net building costs by builders and developers.
- d. Ordering Paragraph 5 (as revised in D.06-12-033, Appendix B). The Commission will require all solar installations for which the CEC has not adopted system ratings ~~building integrated photo-voltaic (PV) systems~~, including those on new construction, to receive incentives through a PBI structure.

2. Conforming changes consistent with this decision shall also be incorporated into the California Solar Initiative Handbook.

3. The Pacific Gas and Electric Company, Southern California Edison Company, and the California Center for Sustainable Energy, formerly called San Diego Regional Energy Office (collectively, program administrators), shall participate in the collaborative effort of the Commission's Energy Division and the CEC staff to develop an appropriate means to incorporate BIPV system data into the Expected Performance-Based Buydown calculation methodology.

Within 30 days of the effective date of this order, absent compelling need, the program administrators shall file in our Docket Office and serve on the service list to this proceeding a compliance filing setting forth the revised methodology in clear and concise terms, with supporting rationale. The assigned Administrative Law Judge has the authority to extend this filing date.

This order is effective today.

Dated August 23, 2007, at San Francisco, California.

MICHAEL R. PEEVEY
President
DIAN M. GRUENEICH
JOHN A. BOHN
RACHELLE B. CHONG
TIMOTHY ALAN SIMON
Commissioners

ATTACHMENT 1

OUTLINE OF CHANGES TO METHODOLOGY

The operating temperature of a photovoltaic module affects its energy output characteristics and efficiency. Building integrated solar PV panels receive less air flow than systems mounted with full ventilation, so they operate at higher temperatures and produce less energy. The temperature of building integrated solar cells is characterized using the Nominal Operating Cell Temperature (NOCT), which is used in conjunction with a calculation procedure to predict the module's temperature for various environmental conditions. To correctly reflect BIPV performance in the EPBB incentive, the CEC has proposed a formula to adjust the PTC¹ rating (and thus the CEC-AC rating) for the modules based on a NOCT specification for BIPV hardware. The PTC adjustment formula will be embedded in the EPBB calculator and will use module model performance specifications. An input field will be added to the EPBB Calculator so users can specify the type of module installation, which will depend on the size of the outdoor air gap underneath the panel.

The CEC PTC adjustment formula is:

$$\text{PTC_adj} = \text{STC} * (1 + (\text{PwrTempCoeff}/100) * (\text{Tmod} - 25))$$

Where:

“PTC_adj” is the adjusted PTC module DC power (watts) rating at installed NOCT

¹ PVUSA Test Conditions (PTC).

“STC” is the module DC power (watts) rating at Standard Test Conditions

“PwrTempCoeff” is the power temperature coefficient of the panel (%/°C)

“Tmod” is the module temperature at PTC, and is calculated:

$$T_{mod} = 20 + 1.389 \times (NOCT - 20) \times (0.9 - n)$$

“NOCT” is either provided by the manufacturer using the test protocol described in the CEC’s NSHP Guidebook, or determined by applying a 20 °C adder to the previous NOCT value.

“n” is the panel solar to DC electric conversion efficiency, and is calculated:

$$N = STC / (1,000 \text{ W / m}^2) / \text{Area}$$

Where “Area” is the panel area in square meters

(END OF ATTACHMENT 1)