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Via U.S. Mail and Email

Mr. Honesto Gatchalian  
California Public Utilities Commission  
Energy Division – Tariff Unit  
505 Van Ness Avenue, 4<sup>th</sup> Floor  
San Francisco, CA 94102

Re: Protest of the Center for Energy Efficiency and Renewable Technologies To  
Southern California Edison Company Advice Letter 2130-E and Pacific Gas &  
Electric Company Advice Letter 3060-E regarding Proposed Modifications to the  
CSI Handbook for Non-PV Solar Thermal Applications

Dear Mr. Gatchalian:

The Center for Energy Efficiency and Renewable Technologies (“CEERT”) hereby protests Southern California Edison Company (“SCE”) Advice Letter 2130-E and Pacific Gas and Electric Company Advice Letter 3060-E. The SCE and PG&E Advice Letters jointly propose new modifications to the California Solar Initiative (“CSI”) Handbook to implement an incentive program for Non-PV solar thermal applications.

CEERT members have been actively engaged in the CSI process from its initiation, and CEERT includes members with a direct interest in the successful implementation of the CSI’s solar thermal incentive program. CEERT appreciates the significant effort the California Public Utilities Commission (“Commission”) staff, the Program Administrators, consultants and interested parties have devoted to developing these draft Non-PV Handbook rules. The draft Handbook modifications are a good first step toward establishing a program for administering the portion of CSI incentive funding earmarked for Non-PV applications. CEERT offers a number of specific suggestions below to better tailor the rules for their fundamental purpose of supporting the development of solar thermal applications in California. However, CEERT has a more fundamental concern about three program design issues: 1) the flawed and complicated proposed methodology for determining “displaced electricity,” 2) the failure to recognize and support the differences between the PV and non-PV market by providing a different set of market triggers and incentive tier reductions that mirror those for PV but are appropriate for the

solar thermal technologies, and 3) the fact that PBI should be applied on a broader basis for these technologies. Each of these key issues is addressed below.

## I. Introduction

Senate Bill 1, the legislative foundation for the CSI program, provided the Commission the power to authorize the award of monetary incentives for solar thermal and solar water heating devices up to \$100.8 million dollars.<sup>1</sup> However, even before passage of SB 1, the Commission had determined in Decision 06-01-024 that “it is our intention to include solar heating ventilation and air conditioning equipment in the (CSI) program.”<sup>2</sup>

In Decision 06-12-033 the Commission took further steps toward this objective, allocating incentive funds for non-PV technologies that displace electricity and providing general guidance for implementation of a solar thermal incentive program. The Commission staff retained industry experts, who participated in a workshop at which industry participants were allowed a one-time opportunity provide input and suggestions on how best to structure a non-PV incentive program for the CSI.

This information builds on an already existing record in the CSI docket, where solar thermal advocates have provided specific program guidance in a number of filings over the course of CSI implementation. For example, the Americans for Solar Power (“ASPv”) May 16, 2006 Comments Regarding Updated Proposal for the California Solar Initiative and Supplemental Questions included an extensive discussion and recommendations regarding the best approach to establishing a solar thermal incentive program within the CSI framework.<sup>3</sup> In this and other filings, ASPv underscored the need for performance based incentives (“PBI”) based on metered solar thermal output for space heating, space cooling, process water, recognizing that advanced solar thermal technologies are extremely diverse in design and highly dependent on the individual host customer’s specific engineering requirements. It appears that the Commission itself has recognized this, noting in Decision 06-12-033 that “the use of certain non-PV technologies could raise unique estimation, metering and measurement issues...”<sup>4</sup>

CEERT has three major issues with the Advice Letter that must be modified. First solar thermal project incentives must *not* be based on the complicated electric displacement proxy methodology proposed in the Advice Letters. CEERT discusses below the inherent flaws in this methodology, which actually systematically underestimates the actual displacement of electricity. In its place, CEERT recommends that the Commission adopt a much more

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<sup>1</sup> Cal. Pub. Res. Code § 2851(b).

<sup>2</sup> D.06-01-024 at 14.

<sup>3</sup> See Comments of Americans for Solar Power Regarding Updated Proposal For the California Solar Initiative and Supplemental Questions at pp. 15-23.

<sup>4</sup> D.06-03-004 at 25.

straightforward and accurate methodology that will calculate displaced electricity by simply metering “useful energy” and using this as the basis for determining incentives. This approach would be more accurate and more consistent with PBI. The second program design issue centers on the need for separate market triggers and incentive reduction schedules appropriate for solar thermal technologies. Finally, PBI should be applied for all commercial and industrial applications or, at the very least, for all solar thermal displacement systems over 30 kW. These three fundamental issues must be resolved in order to create a competitive and transparent market for advanced solar thermal technologies.

CEERT strongly supports incentives for distributed advanced solar thermal technologies as long as they are based on metered performance. Advanced solar thermal technologies are an important distributed generation (“DG”) technology that can help California “green the grid” and significantly help reduce the state’s green house gas footprint. CEERT notes that in a recent National Renewable Energy Laboratory study NREL found that California’s commercial sector has the potential to achieve more than 8 million metric tons of carbon reductions each year from solar thermal technologies.<sup>5</sup> Advanced solar thermal applications, including space heating and air conditioning, can provide the state with significantly more greenhouse gas (“GHG”) reductions. Given the state’s load profile and significant peak demands for air conditioning, it is clearly in the ratepayers’ best interest to create a long-term sustainable market for solar thermal technologies. However, in order to obtain the greatest gain for each dollar of ratepayer and industry investment in solar thermal technologies, the Commission’s non-PV incentive program must be structured correctly from the outset. CEERT’s comments below are focused on this objective.

The Commission in Decision 06-12-033 expressly declined to exclude any non-PV technology from eligibility for CSI incentives.<sup>6</sup> CEERT agrees with this approach. However in order to design incentives that work, the Commission needs to at least identify the currently available, tested, viable technologies that are likely to meet the CSI’s eligibility requirements. With this consideration in mind, these comments address only solar thermal displacement technologies, including specifically: 1) solar thermal water heating that displaces electricity that is not subject to the Center for Sustainable Energy (“CCSE”) pilot program;<sup>7</sup> 2) solar space and process heating that displaces electricity; and 3) solar space cooling and process cooling that displaces electricity. These are the technologies that appear to be the currently viable candidates for Commission funding under the CSI non-PV program and the intent to include these technologies has been noted in the Commission’s prior decisions. The issue of how to

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<sup>5</sup> See Denholm, P. *The Technical Potential of Solar Water Heating to Reduce Fossil Fuel Use and Greenhouse Gas Emissions in the United States*. NREL Technical Report. NREL/TP-640-41157. March 2007

<sup>6</sup> D.06-12-033 at 26.

<sup>7</sup> For simplicity’s sake, this could be defined as including any solar water heating project that both a) displaces electricity and b) consists of over 1,500 square feet of solar thermal collector area.

define in a non-exclusive manner the technologies potentially eligible for CSI non-PV incentives is discussed below.

CEERT appreciates the Commission's consideration of the following comments and recommendations, and looks forward to assisting the Commission in developing a non-PV CSI incentive program for solar thermal displacement technologies that will efficiently and effectively support the development of a strong and vibrant market for these solar thermal technologies in California.

## **II. Procedural Recommendations**

CEERT is concerned that the PAs' choice of an advice letter filing as the vehicle for proposing Handbook changes does not afford interested parties an effective opportunity to comment and review each other's recommendations on the PAs' draft. It is not clear why this approach was used, insofar as Decision 06-12-033 did not prescribe an advice filing, and *did* order that the assigned Commissioner and ALJ would review and approve the changes.<sup>8</sup> At a minimum, the Commission should instruct all parties filing comments to circulate their comments to the entire CSI service list, and allow reply comments by all interested parties. Given that these are substantive Commission rules on matters never previously decided by the Commission, the Commission's action on these Handbook revisions should be through a proposed decision or resolution, with an opportunity for comment by all interested parties.

## **III. Recommended Changes in Draft Handbook Language**

CEERT's recommendations are organized below by Handbook section.

### **SECTION 1**

#### **1.2.2 Special Funding for Non-PV Technologies**

CEERT recommends the following changes to this proposed section:

“Non-photovoltaic (non-PV) technologies include but are not limited to dish Stirling, solar trough and solar cooling. The Legislature provided in SB 1 that “[N]otwithstanding subdivision (a), in implementing the California Solar Initiative, the commission may authorize the award of monetary incentives for solar thermal and solar water heating devices, in a total amount up to one hundred million eight hundred thousand dollars (\$100,800,000).” Section (a) refers to electricity generation from solar PV, not solar thermal displacement or solar hot water.

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<sup>8</sup> D.06-12-033, Ordering Paragraph 6.

The CPUC has included the budget for non-PV technologies within the overall CSI budget, but capped the budget for non-PV solar thermal displacement technologies at \$100.8 million. In Decision 06-012-033, the CPUC indicated that “[A]t the same time, SB 1 allows us to spend up to \$100.8 million for incentives to solar thermal and solar water heating devices. Therefore, we will include solar thermal and solar water heating in our CSI incentive program, but only those solar thermal technologies that displace electric usage.”

Any MW from non-PV technologies will be counted toward and paid at the current MW trigger level; except, however, non-PV solar thermal displacement technologies will have a separate MW trigger level (see Section 1.3 below for further discussion of this issue).”

The above changes reflect the intent of the Legislature and the Commission and properly reflect that funding is clearly divided between solar electric generation and solar thermal displacement technologies. Solar forced air heating is a technology that has not been mentioned in the CSI record, and it is not clear that it belongs on the list of established solar thermal application enumerated as examples in the first sentence of this section. For example, it is not clear whether this technology is related to solar PV and electric generation or to solar thermal and electric displacement. Although CEERT supports all solar thermal technologies that are market ready and agrees with the Commission that all eligible and viable technologies should be eligible under the CSI, the Commission needs to develop a record on this technology before inclusion in the program and for the time being should not include it on the list of examples of solar thermal technologies provided in section 1.2.2.

### **1.3 MW Targets and Step Triggers for CSI Program**

In suggesting how to calculate MW targets and step triggers for solar thermal displacement technologies, CEERT offers two recommendations.

First, non-PV solar displacement technologies should have a separate MW target and incentive trigger system. CEERT recognizes that the Commission in Decision 06-12-033 initially instructed that non-PV incentive levels and triggers should be exactly the same as for PV.<sup>9</sup> However, this approach does not result in an incentive schedule that takes into consideration the differences between PV and non-PV technologies, costs, market development and objectives. CEERT urges the Commission to take these differences into consideration and develop an incentive structure that makes sense for this industry.

Developing a separate non-PV incentive structure would properly reflect the fundamental purpose of the declining rebate schedule. As the Commission explained in Decision 06-08-028:

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<sup>9</sup> D.06-12-033 at 25.

The Commission's objective in establishing a declining rebate schedule was to reduce incentives over time as technologies become more efficient and less costly, with the hope that incentive reductions would drive the market price of solar energy down to the level where ratepayer subsidies are no longer required.<sup>10</sup>

. . . we want to avoid the risk of reducing incentives before the economics of the solar industry have caught up to our incentive levels.<sup>11</sup>

In Decision 06-12-033, the Commission indicated that it "will reassess incentives for non-PV technologies in its periodic CSI review, as set forth in D.06-08-028. There, the Commission may evaluate the participation of non-PV technologies in CSI and the need for incentives based on industry economics and market conditions."<sup>12</sup> CEERT supports this reassessment, but urges the Commission to take industry economics and market conditions into consideration from the outset in developing an appropriate incentive structure and triggers for non-PV technologies. Otherwise, the Commission starting the program off with an incentive structure that bears no relationship to the technologies it is supposed to encourage, while promising the fix the problem at some point in the future.

Second, due to the limited size of this portion of the program, CEERT would advocate for one statewide trigger. In developing the CSI's incentive structure for PV, the Commission "reluctantly" established separate triggers for each utility service area. This was to take into consideration the unique characteristics of the solar market in the different geographic regions of the state. These considerations may apply, to a certain extent, for solar thermal, but given the relatively limited funding allocated to this program and the administrative complexity involved in utility-specific triggers, CEERT recommends opting for a single statewide trigger.

#### **1.4 Incentive structure.**

For reasons discussed above and also below in the section discussing PBI, CEERT recommends that a separate table of incentives be applied to solar thermal technologies. To accomplish this, CEERT proposes adding the following as a subsection (possibly 1.4.3) within the Handbook:

##### **1.4.3 Targets and Step Triggers for Non-PV Solar Thermal Displacement Technologies**

The incentive levels for this portion of the CSI will be automatically reduced over the duration of the program based on the volume of MW of reservations issued under this category. Projects are counted toward the MW trigger once they are deemed eligible, have paid an

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<sup>10</sup> D.06-08-028 at 83.

<sup>11</sup> Id. at 87.

<sup>12</sup> D.06-12-033 at 27.

application fee (if applicable), and received confirmed reservation. Unlike the PV portion of this program, these MW targets and step triggers will be included in one statewide level and not vary across Program Administrator service territory. Incentive levels may vary by residential and non-residential sectors based on the demand for those customer segments.

For purposes of this category of technologies, PBI will be applies to all commercial and industrial and EPBB to all residential.

#### **1.4.3.1 PBI**

Step	MW in Step	Commercial	Gov/Non-Profit
1	30	0.39	0.50
2	30	0.34	0.46
3	35	0.26	0.37
4	35	0.22	0.32
5	40	0.15	0.26
6	45	0.09	0.19
7	50	0.05	0.15
8	55	0.03	0.12
9	60	0.03	0.10
10	65	0.03	0.10
Total	445		

#### **1.4.3.2 EPBB**

(CEERT did not address smaller applications and has thus not provided a table covering EPBB.)

#### **1.6.2 Self-Generation Incentive Program (SGIP)**

In paragraph five of this section, the Handbook discusses CSI and solar electric water heaters, indicating that they will not be included until a measuring, metering, and measurement guidelines are established. We believe that this statement is incorrect, as the Handbook establishes the required parameters, and should be deleted. The Handbook itself makes this statement in Section 2.2. It is possible that this statement was intended to apply to hot water heaters under the CCSE Pilot, as mentioned in 2.2.3 of the Handbook.

## **1.8 Non-PV Systems**

The Program Administrators have proposed that non-PV systems are eligible to apply for funding starting July 1, 2007. Although CEERT applauds this effort to move the program forward, the CPUC indicated in Decision 06-12-033 that the incentives would be effective upon Commission approval. As a practical matter, the Commission cannot start up the non-PV program until all issues are resolved and the PAs are prepared to administer the program. As noted above, the July 1, 2007 date seems to be driven by the fact that these draft Handbook revisions were issued through the advice letter process, which is not really designed for this purpose. The Commission should address this procedural issue in a manner that allows parties an opportunity to review each others' comments, to reply to such comments. On the basis of this record, the Commission needs time to resolve issues and issue a draft decision (or resolution).

## **SECTION 2**

### **2.2.3 Eligibility of Non-PV Systems**

CEERT recommends modifying the list of included technologies in this Section as follows:

#### **Qualifying Solar Thermal Displacement Technologies**

- Solar water heating when included as part of a solar thermal heating or cooling system or a stand-alone hot water system that has at least 1,500 square feet of collector area,
- Solar space & process heating,
- Solar driven space cooling and process cooling (absorption & adsorption chillers, desiccant systems, etc.)

#### **CCSE Pilot Program.**

- The Commission, at its discretion, may add technologies currently being developed under the Pilot to this Handbook.

#### **CSP**

Per CPUC Decision 06-12-033 “[a]s new solar non-PV technologies become viable, project proponents may apply for incentives as long as they meet other CSI eligibility criteria.”

CEERT’s comments and recommendations take into consideration only the solar thermal displacement technologies as listed above at this time. The intent to include these technologies



had been noted in numerous decisions by the Commission. All of these applications are viable, well-established and marketable, and all have the potential for commercialization if supported by a well-structured program of declining incentives. In order to distinguish hot water heaters that displace electricity and that are administered under the CSI from the CCSE Pilot technologies, CEERT also advocates a minimum size limit for stand-alone hot water installations. Finally, CEERT does not include passive solar technologies (such as daylighting, solar wall or similar devices), in its proposed list and definition in that these applications are fundamentally different in function and economics and are more closely affiliated with energy efficiency.

For purposes of the CSI, we would propose the following definition for the definition section:

“Solar thermal displacement technologies’ means ‘mechanical devices or systems that utilize solar thermal energy (sunlight) for residential, commercial, or industrial space heating, space cooling, hot or chilled water, or a combination of these purposes. Hot water only systems smaller than fifteen hundred (1,500) square feet of collector area do not qualify.’”

We believe that this proposed definition will allow other technologies to be added to the list as they arise.

CEERT further recommends that the Commission establish a participation cap. In Decision 06-12-033 the Commission declined to establish a cap, but in the initial months of CSI implementation for PV, it has become clear that caps are necessary to ensure that the program achieves its goal of developing the entire market. This objective cannot be achieved if a limited number of large host customers use all available incentives. CEERT suggests a 10% cap per customer per incentive level as an appropriate cap.

### **2.2.5 Equipment Certification and Rating**

The Program Administrators have advised that Non-PV solar thermal displacement systems must be safety and performance certified by a NRTL.

CEERT offers the following observations on this issue:

- 1) Systems for commercial applications are typically custom designed and include equipment from multiple manufacturers making “system certification” impractical.
- 2) All systems contain solar collectors. Collectors must be performance certified by a nationally or internationally recognized testing laboratory.
- 3) Underwriters Laboratory (UL) is the premier laboratory in the U.S. that certifies the safety of equipment. UL does not have any solar collectors that have been submitted for

certification for safety. Historical operation has indicated that solar collectors do not pose a safety risk and that safety certification is unnecessary.

In sum, the Handbook requirements should reflect reality and should not include certification requirements that cannot be met.

### **2.2.5.1 Non-PV System Capacity Rating**

The Program Administrators have advised that the capacity rating for solar thermal systems be calculated using an algorithm that includes calculation of displaced electricity.

CEERT believes it is not advisable to use a displacement approach for calculating incentives as further discussed below, and, therefore, it is not appropriate to use displacement when determining system capacity rating.

Determination of solar thermal system capacity rating serves two purposes in the CSI framework:

- 1) Insures that the system does not exceed the system capacity limit, and
- 2) Allows determination of when incentive steps are triggered

(Note that capacity rating is not used to determine incentives for a given system as incentives are awarded based on energy production, not capacity, under the PBI approach)

Given these uses, CEERT recommends that system capacity rating be determined using the International Energy Agencies standard for solar thermal collectors of 0.7 kW per square meter of collector (See Appendices). This recommendation is based on the following:

- 1) Provides an internationally developed and recognized standard
- 2) Is simple to calculate
- 3) Fits within the PBI structure
- 4) Facilitates a simple system of determining both capacity limits and step triggers

### **2.2.6 System Size**

CEERT believes that the 1 MW size limit was established with PV systems in mind and the application to solar thermal systems was not fully contemplated. To illustrate this point:

Using the IEA capacity standard (see comments on Section 2.2.5.1 and Appendices) a 1 MW system would have a collector array sized at approximately 15,000 square feet and would cost \$1 to \$1.5 million dollars depending on the type of application (heating, cooling, etc.). The

largest solar thermal system in the world approaches 200,000 square feet and there are several systems installed worldwide significantly larger than 15,000 square feet. A 100,000 square foot building in California could easily use a 2 to 3 MW system to provide space cooling, space heating and or hot water.

In contrast, a 1 MW PV system would have a collector array of approximately 100,000 square feet and would cost approximately \$9.5 million. A 1 MW PV system is considered “very large” and they are relatively rare in distributed generation applications, as exemplified by the recent announcements of several “big box” stores such as Staples, Target, Kohls, Macy’s, etc. to install PV systems in California ranging in size from 200 to 400 kW.

With this in mind, CEERT encourages the Commission to consider establishing a comparable size limit. Although CEERT believes that a maximum of 9 MW would be comparable, considering the smaller thermal budget, we would suggest 5 MW as a comparable number under the CSI. This would provide for the following:

1. It is highly probable that California would be home to the world’s largest solar thermal cooling systems under the 9 MW size limit, but a 5 MW limit will still encourage development of a robust market.
2. Providing incentives for larger systems would facilitate the delivery of renewable energy at lower costs as larger systems are more cost effective.
3. A 5 MW solar thermal system is in keeping with the objectives of the CSI when setting the size limit for PV systems.<sup>13</sup>

## 2.4 Warranty Requirements

Solar thermal systems are typically custom engineered and include equipment from multiple manufacturers. Industry practice is to pass the manufacturers’ warranties through to the customer. Warranties for these components are typically significantly less than 10 years. Many of these components are not specific to the solar thermal industry alone, and this is also common practice outside of the solar arena. CEERT suggests that all components should require that the manufacturers’ warranties be passed to the customer.

CEERT believes that the warranty requirements were developed with PV systems in mind. PV systems are vastly different than solar thermal systems in that they have relatively

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<sup>13</sup> There is some ambiguity as to whether the 1 MW size limit established in statutory definition of “solar energy system” under the CSI (which appears to relate to PV generation). Insofar as solar thermal applications do not generate energy or “alternating current peak electricity” it appears the Commission could reasonably conclude that the 1 MW limit applicable to PV does not apply to solar thermal applications.

few parts and those parts are primarily electrical as opposed to the multitude of parts in a solar system and the fact that these parts are primarily mechanical.

The one component that is similar in nature to PV systems is the solar collector. CEERT supports a 10 year warranty for solar collectors. The proposed Handbook requires a 10 year warranty on the “solar generating system only, including collectors, tracking mechanisms, heat exchangers, pumps, heat driven cooling system associated with the solar system.” This should be modified to provide a 10 year warranty on solar collectors only.

## **2.8 Time of Use Rates**

Time of use rates should be optional for solar thermal displacement technologies as they are for PV.

## **2.9 Metering Requirements**

CEERT supports the proposed metering requirements as consistent with industry practice.

## **SECTION 3**

### **3. California Solar Initiative Incentive Structure**

As discussed above, CEERT has two significant concerns regarding CSI incentive payments for solar thermal technologies: the proposed displacement methodology and the need for a PBI payment structure for all commercial installations. Each of these is discussed in detail below.

#### **Displacement methodology issue**

CEERT protests the use of the proposed displacement methodology, indeed, the use of displacement measurement entirely, for solar thermal technologies. Although these technologies do displace electric energy, unlike energy efficiency measures, these technologies are more adequately described as energy production systems. Due to the nature of these systems and the detailed engineering required to design them, they are more expensive than energy efficiency measures. The systems use solar collection, not to directly turn sunlight into electricity, but to turn sunlight into thermal energy to run mechanical systems that displace electricity.

For these and other reasons discussed below, CEERT proposes using measurement of the useful energy produced by these systems, not the displacement methodology proposed by the PAs. To do otherwise will prevent a market for these technologies from developing in

California. To assist the Commission in understanding the issues, we address them individually here.

1) Inadequate Incentive Amount

As proposed, the displacement approach will not provide sufficient incentive to motivate building owners to purchase solar driven cooling systems. For example, over the five year incentive period the system owner would receive approximately \$147,000 in incentive payments on a system that cost the owner approximately \$1 million. The \$147,000 is approximately 15% of the purchase price, and given the overall system economics, it is too little to motivate most building owners to purchase a system.

CEERT does believe that there will be a handful of building owners that will purchase solar cooling systems at the proposed incentive level for reasons beyond economic incentive, but, this will not accomplish the goals of industry building, system cost reduction and diversity of renewable energy sources.

2) Treatment Different than Treatment of PV

Contrary to the Commission's order, such an approach would also have the effect of treating these thermal technologies differently than PV. Solar thermal collectors are incredibly efficient (50-60%) although chillers used with solar are not yet very efficient. As the market is created, these chillers will see an increase in efficiency.

Although this Commission is requiring energy efficiency audits, it is not rejecting PV installations that feed inefficient electric chillers or other on-site equipment.

3) Proposed Displacement Approach understates Displaced kWh which Results in Reduced Incentive Amount

Attachment B to the PAs Advice Letter states that "It can be challenging to accurately establish the Performance Ratio. " and "... rated performance (even if seasonally or load adjusted) is rarely duplicated in real-world installations." These statements and others help the reader to understand that the displacement approach probably underestimates the actual volume of electricity that would be displaced by a solar cooling system. (See Appendices for further discussion.)

CEERT believes that rather than potentially understating the volume of electricity displaced by solar cooling the program and the ratepayers are better served at this time if it errs on the side of overstating electric displacement. This belief is based on the program objectives, which include reducing the load on the grid -- one of the major characteristics of solar cooling.

#### 4) Useful Energy Approach is Simple for Vendors, Customers, and Administrators

The displacement approach will be difficult for vendors to calculate and explain to their potential customers. Customers will have a difficult time understanding the displacement approach. Both of these conditions will act as barriers to market development as the market is slow to adapt concepts that seem complex. Further, program administrators will have to make sure that the displacement calculations are done correctly in order to insure that the appropriate incentive payments are provided. All of these steps could add large administrative costs that are out of proportion to the size of the budget.

The useful energy approach proposed by CEERT will be simple to understand by both vendors and prospective customers. It is as simple as saying “You meter the energy output from the chiller and receive incentive payments based on the metered output.” Program administrators will only need to insure that the metering is correct (which is also required using the displacement approach) and will not need to make sure that the displacement is correctly calculated.

#### 5) Arizona Rejected the Displacement Approach for Its Solar Cooling Incentive Program

The first program designed to provide incentives for solar cooling was developed in Arizona beginning in 2004. Several workshops were held that included representatives from regulatory agencies, utilities, technical community and industry. This group of experts rejected the displacement approach based on many of the reasons given above. CEERT believes that it is significant that Arizona, a state whose overwhelming renewable resource is solar and which has been the pioneer in a program for solar cooling, chose to reject the displacement approach. (See Appendices for the Arizona Program)

CEERT’s alternative proposal:

CEERT recommends the adoption of a “useful energy” approach for all solar thermal systems whereby energy production is metered and the incentive is applied to that metered measurement. For example, for a solar driven cooling system the chilled water production would be metered in kWh and the incentive level (e.g. \$.39) would be applied to the metered kWh to determine total incentive using a PBI approach. This is by far the best means of calculating incentives.

While CEERT feels strongly that the “useful energy” approach should be adopted, CEERT also has considered alternative ways of improving on the unworkable approach offered

by the Advice Letters. CEERT offers for consideration the following approaches for solar driven cooling systems:

#### 1. USE OF A PERFORMANCE RATIO OF 1.0 FOR SOLAR DRIVEN COOLING

The discussion above regarding “useful energy approach” provides the reasons for using this approach to calculate the incentive for solar driven cooling. This approach is our first choice for solar driven cooling and all other solar thermal systems.

As our second choice for calculating the incentive for solar driven cooling we recommend that the algorithm used to determine the incentive amount use 1.0 as the Performance Ratio (Solar Cooling Fixed PR approach). The net effect of this is that the incentive level for solar driven cooling would equal the incentive as calculated with the useful energy approach. Given this, the reasons for implementing the useful energy approach would apply to the Solar Cooling Fixed PR approach.

The Commission may find it advantageous to use this approach as opposed to the useful energy approach for the following reasons:

- 1) Most of the suggested Handbook modifications by the PAs would stay intact. With the useful energy approach numerous changes to the PAs’ modifications would be required. This would be time consuming and may delay program implementation.
- 2) Should it be determined at a later date that the Performance Ratio needs to be changed it would be a relatively simple task to do so.

#### 2. USE OF A COP OF 2.0 FOR CALCULATING THE PERFORMANCE RATIO FOR SOLAR DRIVEN COOLING

As our third choice for calculating the incentive for solar driven cooling we recommend that the algorithm used to determine the incentive amount use a COP of 2.0 when calculating the Performance Ratio.

We believe there is strong evidence to indicate that the PAs’ suggested approach to determining the energy efficiency of the displaced cooling equipment results in a significant understatement of the amount of electricity that would be displaced by the typical solar driven cooling system. The use of a 2.0 COP would more accurately reflect the real-world performance of electric driven cooling systems. Please see the Appendices for further discussion.

## **PBI**

CEERT strongly recommends that PBI be utilized for all commercial and industrial solar thermal installations under CSI, and that only residential installations receive EPBB. At the very least, since there will be no market disruption for a technology new to the incentive program, PBI should be required for all systems over 30 kW starting on the effective date of the incentives. PBI is used in similar programs in the EU and elsewhere, and is clearly a simpler and superior way of ensuring that the ratepayers of California are getting performance benefits from their investment in incentives.

Active solar thermal technologies that displace electricity and provide space heating, space cooling and process water by nature require detailed site-specific one-on-one engineering design. There is no certification process within the United States that captures the performance of advanced application of solar thermal heat applications. The Solar Rating and Certification Center certifies smaller domestic and commercial hot water systems. However, it is widely recognized within the industry that each space heating, space cooling or process water system requires specific individualized engineering. System performance cannot be predicted generically for a particular type of technology, as there are far too many equipment and end use variables. Stated more directly, there are simply there far too many ways to cheat on a standardized approach to assessing system performance. The only accurate and transparent approach for determining more complex thermal systems' performance is an output meter. It would be unfortunate were the Commission to repeat the solar thermal program design mistakes that the Legislature and state made in the 1980's. Solar thermal DG offers too much potential – both as a key renewable resource and in terms of measurable reduced GHG -- to waste ratepayer funding on a known faulty program design.

As both the Legislature and the Commission have recognized, performance-based incentives for space heating, space cooling and process heat that displace electricity are essential to a successful CSI program design. PBI offers market transparency and accuracy, but more importantly it protects the ratepayer's investment. Under PBI, no incentive is provided if the system fails or falls short of its projected output as each system receives incentives based on actual output. Perhaps one of the most important aspects of PBI is that it encourages competition, innovation and decrease in cost. CEERT believes that for the CSI non-PV incentive program to maximize returns for its modest \$100.8 million investment, PBI must be implemented for all solar thermal systems that are not included in the CCSE pilot program. Only solar thermal systems included in the CCSE pilot should be provided an up-front one-time incentive payment, as the purpose of this pilot is to determine whether the SRCC guidelines are adequate and if incentives are required to expand this important technology. All other solar thermal incentive systems should be based on a metered PBI format.



If CEERT's recommendation is adopted, other conforming changes need to be made throughout the Handbook.

### **3.5 CSI Program Database**

This section specifies that PV will have an on-line database and specifies what information will be included. CEERT requests that, by July 1, 2008, solar thermal displacement technologies be included in the CSI program database.

## **SECTION 4**

CEERT offers the following suggestions for changes in the Handbook revisions proposed for Section 4:

### **Section 4. Application Process for California Solar Initiative Projects**

"PV," but should be deleted and replaced with "non-PV".  
For large commercial, non-PV technologies need 15 months for retrofit and 21 months for new and government due to longer engineering design process.

#### **Section 4.1**

CEERT recommends a One-Step process for advanced solar thermal technologies:

- 1) Completed Reservation Request Application with Original Signature on CSI program Contract. Detailed engineering is required for each project site. Requirement of signed Contract is premature. We suggest that this requirement should be included in the "proof of project advancement" stage. It should be noted that the details engineering involved is a substantial part of the total project costs.
- 2) Proof of Electric Utility Service for Site. No change necessary.
- 3) System description worksheet. It should be understood that this description is preliminary and brief as it cannot be a full engineering analysis.
- 4) Electrical systems sizing documentation (new/expanded load only). This should not be needed unless the proposed project involved a newly constructed building or facility.
- 5) Application fee- this fee should be refundable for projects where the final engineering and load profiling finds that the technology is not adequate for site. As noted above the detailed engineering studies required are very expensive. Project applicants that conduct such studies are serious proposals and not speculative in nature.
- 6) Certificate of tax-exempt status and AB 1407 compliance for government and Nonprofit. No change necessary.
- 7) Documentation of an Energy Efficiency Audit. One-page certification that customer signs indicating that they have completed and energy audit is adequate.

- 8) Printout of EPBB Calculation tool – Not required for solar thermal
- 9) Copy of executed agreement for solar system purchase. No change needed.
- 10) Copy of executed Alternative Ownership Agreement (If System Owner is different than Host Customer)- No change needed
- 11) Copy of Application for Interconnection- No interconnection agreement should be required for solar thermal as no electricity is being generated. Power being generated on site is thermal not electrical. There are no solar thermal safety concerns with the utilities distribution or transmission system.
- 12) Host customer certificate of insurance. This requirement should be made later in the process. After final detailed engineering has identified the detailed specifications for the project.
- 13) System owner certificate of insurance. If different than host customer, same as 12 above.

#### **Section 4.2.5.4 Confirmed reservation**

If a confirmed reservation is granted and the level is reduced the applicant will be notified. The Commission must make an expedited effort to have the on-line application system on line for solar thermal technologies. This process must be streamlined and properly adapted for solar thermal.

#### **4.2.7 Milestone Package**

The only milestone requirement should be proof of detailed engineering study completion and project insurance. This section must be revised to accommodate solar thermal.

#### **4.4 Incentive Payment Process**

Completion must include thermal power generation, not just “electric generation.”

Reference in Sections 4.4, 4.4.1, and 4.4.3.1 should be modified to eliminate the requirement for interconnection for solar thermal installations.

##### **4.4.5.2 Payment Terms**

Must change formula, as displacement is not the proper metric for solar thermal technologies. As indicated previously, incentive must be based on useful thermal output.

#### **4.6.1 Field Inspection**

No need to verify interconnection. Sizing issue must be tailored to solar thermal.

## **SECTION 5**

### **5.1 Connection to the Utility Distribution System**

Section 5.1 specifies that a “copy of Generating Facility Interconnection or Net Energy Metering Agreement also must be submitted with the utility’s written letter authorizing parallel operation to the Program Administrator prior to the reservation expiration.” Due to the fact that solar thermal displacement technologies systems do not interconnect, it should be made clear that this section is not applicable.

## **SECTION 10**

### **10.0 Appendix A: Description of Total Eligible Costs**

This checklist is designed for PV systems and should be modified to reflect other technologies as added. For example, a chiller is not list and mounting systems are specified as allowed for PV only.

### **Appendices B, D, and G**

Comments to the above-cited appendices are contained in the appropriate sections of these comments.

## **IV. Contact Information**

Please direct all correspondence regarding this protest to:

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June 20, 2007  
Page 20

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Thank you for consideration of this protest. If there are any questions, or if we can provide further clarification of the above recommendations, please contact us at the above number.

Respectfully,

By: \_\_\_\_\_

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# Recommendation<sup>1</sup>: Converting solar thermal collector area into installed capacity (m<sup>2</sup> to kW<sub>th</sub>)

## 1. Introduction

In the past, the installed base of solar thermal systems was measured in terms of collector area (square meters or square feet) rather than in terms of installed capacity to produce heat. As a consequence, solar thermal was not easily comparable with other (renewable) energy sources and thus was often left out of relevant statistics.

On 8<sup>th</sup> September 2004, representatives of the International Energy Agency's Solar Heating and Cooling Programme (IEA SHC) and several major solar thermal trade associations met in Gleisdorf, Austria (for a list of participating associations please see the end of this document). During this meeting, they discussed and agreed on an official recommendation for how to convert solar thermal collector area into installed capacity. Work is currently being done on defining also a suitable methodology to convert collector area into energy yield.

This recommendation was published jointly by IEA SHC and the involved associations who hope that this methodology will be used worldwide by all those who are concerned with solar thermal statistics.

## 2. The recommended conversion factor

For the purpose of solar thermal statistics, the installed capacity ([kW<sub>th</sub>] – Kilowatt thermal) shall be calculated by multiplying the aperture area of the solar collector area [m<sup>2</sup>] by the conversion factor 0.7 [kWth/m<sup>2</sup>].

This factor shall be used uniformly for unglazed collectors, flat plate collectors and evacuated tubular collectors.

## 3. Explanatory Note

The following notes explain the origins of the conversion factor of 0.7 kWth/m<sup>2</sup>.

### 3.1 Area

Three definitions of collector area exist:

- Absorber area = the area of absorber
- Aperture area = the area in which the solar radiation enters the collector
- Gross area = the area based on the outer dimensions of collector

All three areas are defined for glazed liquid heating collectors in the European standard EN12975-2 annex I. In EN12975-2 test reports all three areas are given. Efficiency coefficients in these reports are given based on both absorber area and aperture area. As there is a current trend towards using aperture area on certificates (e.g. DIN CERTCO Solar Keymark, SPF Factsheets) aperture area<sup>2</sup> shall be used.

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<sup>1</sup> This document is based on a discussion paper by ESTIF technical consultant Jan Erik Nielsen.

<sup>2</sup> For unglazed collectors the three areas are the same

This implies:

- It is assumed that the existing statistics have counted aperture area.
- Aperture area should be counted in future statistics.
- Capacity conversion is done using the efficiency based on aperture area.

### 3.2 Collector classification

Proposed collector classification:

1. Unglazed flat plate collectors: All unglazed collectors (selective and non-selective, tubes, tube/fin, all-wetted, ...).
2. Glazed flat plate collectors: All glazed collectors of every type (single/double glazed, with/without convection suppression, selective and non-selective, tubes, tube/fin, all-wetted, air/gas...).
3. Evacuated tubular collectors: All types of evacuated tubular collectors (heat-pipe, direct, tube/fin, all-glass, ...).

### 3.3 Typical collector efficiency

The capacity conversion is based on the following simplified typical collector efficiencies (based on aperture area):

1. Unglazed flat plate collectors<sup>3</sup>:  $\eta_0 = 0,90$ ,  $a_1 = 20,0 \text{ W}/(\text{K} \cdot \text{m}^2)$ ,  $a_2 = 0,00 \text{ W}/(\text{K}^2 \cdot \text{m}^2)$
2. Glazed flat plate collectors<sup>4</sup>:  $\eta_0 = 0,78$ ,  $a_1 = 3,2 \text{ W}/(\text{K} \cdot \text{m}^2)$ ,  $a_2 = 0,015 \text{ W}/(\text{K}^2 \cdot \text{m}^2)$
3. Evacuated tubular collectors<sup>5</sup>:  $\eta_0 = 0,76$ ,  $a_1 = 1,2 \text{ W}/(\text{K} \cdot \text{m}^2)$ ,  $a_2 = 0,008 \text{ W}/(\text{K}^2 \cdot \text{m}^2)$

### 3.4 Operation conditions

For the capacity conversion the following typical operation conditions are assumed<sup>6</sup>:

1. Unglazed flat plate collectors:  $G = 1000 \text{ W}/\text{m}^2$ ,  $T_a = 20 \text{ }^\circ\text{C}$ ,  $T_m = 30 \text{ }^\circ\text{C}$ ,  $u = 1,5 \text{ m/s}$
2. Glazed flat plate collectors:  $G = 1000 \text{ W}/\text{m}^2$ ,  $T_a = 20 \text{ }^\circ\text{C}$ ,  $T_m = 50 \text{ }^\circ\text{C}$
3. Evacuated tubular collectors:  $G = 1000 \text{ W}/\text{m}^2$ ,  $T_a = 20 \text{ }^\circ\text{C}$ ,  $T_m = 50 \text{ }^\circ\text{C}$

### 3.5 “Installed” or “nominal” capacity: Capacity per m<sup>2</sup> of collector area

Definition 1:

“Nominal Capacity” of unglazed flat plate collectors is the instantaneous thermal output of the collector with the operation conditions:

- $G = 1000 \text{ W}/\text{m}^2$
- $T_a = 20 \text{ }^\circ\text{C}$
- $T_m = 30 \text{ }^\circ\text{C}$
- $u = 1,5 \text{ m/s}$

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<sup>3</sup> Estimate

<sup>4</sup> Average of last 10 EN tested flat plate collectors in SPF Collector Catalogue 2004

<sup>5</sup> Average of last 10 EN tested ETC collectors in SPF Collector Catalogue 2004

<sup>6</sup> These operation conditions are given in the power tables in the “conformity report” in the EN12975-2

Definition 2:

“Nominal Capacity” of glazed flat plate collectors and evacuated tubular collectors are the instantaneous thermal output of the collector with the operation conditions:

- $G = 1000 \text{ W/m}^2$
- $T_a = 20 \text{ }^\circ\text{C}$
- $T_m = 50 \text{ }^\circ\text{C}$

Definition 3:

“Specific Nominal Capacity” of a collector is the nominal capacity of a collector divided by its aperture<sup>7</sup> area.

Using the assumption above, the factor for converting – for each collector type – square meters of collector area to specific nominal capacity:

1. Unglazed flat plate collectors:  $P/A = 0.7 \text{ kW}_{\text{th}}/\text{m}^2$
2. Glazed flat plate collectors:  $P/A = 0.671 \text{ kW}_{\text{th}}/\text{m}^2$
3. Evacuated tubular collectors:  $P/A = 0.717 \text{ kW}_{\text{th}}/\text{m}^2$

Taking into consideration the uncertainty on each value it is reasonable to use only one value:  $0.7 \text{ kW}_{\text{th}}/\text{m}^2$ .

#### **4. Participating organisations**

The following organisations participated in the Gleisdorf meeting where the conversion factor of  $0.7 \text{ kW}_{\text{th}}/\text{m}^2$  was agreed upon:

- **Austria Solar** – [www.austriasolar.at](http://www.austriasolar.at)
- **Bundesverband Solarindustrie, Germany (BSi)** – [www.bsi-solar.de](http://www.bsi-solar.de)
- **Canadian Solar Industries Association (CanSIA)** – [www.cansia.ca](http://www.cansia.ca)
- **European Solar Thermal Industry Federation (ESTIF)** – [www.estif.org](http://www.estif.org)
- **Holland Solar** – [www.hollandsolar.nl](http://www.hollandsolar.nl)
- **Solar Heating and Cooling Programme of the International Energy Agency (IEA SHC)** – [www.iea-shc.org](http://www.iea-shc.org)
- **Solar Energy Association of Sweden (SEAS)** – [www.solenergiforeningen.se](http://www.solenergiforeningen.se)
- **Solar Energy Industries Association, USA (SEIA)** – [www.seia.org](http://www.seia.org)

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<sup>7</sup> For unglazed collectors the aperture area equals the absorber area

## **FURTHER DISCUSSION ON “USEFUL ENERGY APPROACH” vs. “DISPLACEMENT APPROACH”**

CEERT objects to the methodology for calculating incentives described in “3.3.1 PBI for Nov-PV Thermal Systems” as it applies to solar driven cooling. CEERT recommends the following modifications to the wording in this section:

For solar driven cooling, the useful monthly energy (kWh/month) will be calculated by determining the measured delivered cooling (in equivalent electric thermal) and, if required, subtracting the system’s measured ancillary load (kWh/month). The incentive payment is then determined by multiplying the net useful monthly energy with the incentive rate (\$/kWh).

Example #1 – Solar Space Cooling System

$$\text{USCE} = \text{TNPV} - \text{EAUX}$$

$$\text{\$PBI} = \text{USCE} \times \text{\$Erate}$$

“USCE” = Useful solar cooling energy

“TNPV” = Measured thermal cooling output of the non-PV system (which may include an absorption chiller or other heat driven cooling system) in Btu/month.  
“

“EAUX” = Ancillary electric equipment (e.g. pumps, etc.) used for the solar thermal system operation.

Metering the thermal output of solar hot air systems, within reasonable accuracy and cost is difficult.

“\$PBI” = Monthly PBI incentive payment.

“\$Erate” = Current step PBI incentive rate (e.g. \$0.34/kWh)

CEERT recommends these modifications for the following reasons:

1. It can be challenging to accurately establish the Performance Ratio (.PR.). For electric resistive heating systems, the Performance Ratio is fairly constant over the load range and is relatively unaffected by outdoor ambient conditions. However, other electric systems, such as heat pumps and vapor compression air conditioning equipment, have highly variable performance ratios over the load range and are significantly affected by outdoor ambient conditions.



There already exist standards for rating the performance of electric heating and cooling systems. However, rated performance (even if seasonally or load adjusted) is rarely duplicated in real-world installations. This is primarily due to off-design operation of the equipment, inadequate maintenance, poor equipment installation, and/or ambient conditions different than used for rating purposes.

In order to characterize the Performance Ratio for specific situations, baseline heating/cooling load data collection and electric equipment modeling would be necessary. This is prohibitively costly and time consuming.

Another important downside to using installed actual performance of electric heating and cooling systems to determine the Performance Ratio, is that poorer performing equipment would result in higher displaced electricity. This provides a disincentive for utility customers to replace less efficient heating and cooling equipment for higher efficiency equipment. This counters the California Solar Initiative's intent to encourage end-use efficiency.

To encourage end-use efficiency and reduce participate and administrator overhead we recommend that the Performance Ratio be determined by utilizing statewide minimum efficiency standards.

We recognize that the current standards for rating the performance of cooling systems do not accurately capture the real-world performance. Industry's experience is that cooling systems operate at a rate that is two to three times less efficient than their standard rating.

Selection of a performance rating that is unrealistically high penalizes solar cooling technologies in that it results in underestimating the positive impact of solar cooling in displacing fossil fuel generated electricity.

Although CEERT agrees with the concept of replacing less efficient cooling equipment with higher efficient equipment, in the case of solar cooling: a) In real-world applications it is unlikely that the economics of upgrading to a more efficient cooling system would be sufficient to motivate a building owner to make the necessary large capital expenditure, therefore, it is unrealistic to assume that solar cooling "competes" against high efficient equipment. b) Should an owner be considering cooling system efficiency upgrade versus retrofit with solar cooling, retrofitting with solar cooling is the better choice given the objectives of increasing the use of renewable energy and reducing carbon emissions.

2. For new construction the proposed methodology assumes that the mechanical system would have been designed using the most energy efficient system possible. Real-world conditions indicate that this is seldom the case in that first cost considerations typically dominate the selection of mechanical systems.

3. The proposed methodology would result in incentive payments that are too low to stimulate the widespread use of solar driven cooling and the development of the commercial solar thermal industry in California.

Adopting the methodology proposed here by CEERT in combination with CEERT's proposal for incentive levels will help to insure that the solar driven cooling industry receives adequate incentive to install systems in California. Installation of solar cooling systems on a widespread basis will have the positive impacts intended by the CSI, namely: 1) Reduce the load on the grid, 2) Replace fossil fuel generated electricity with renewable energy, and 3) Reduce carbon emissions.

ORIGINAL  
OPEN MEETING



0000041302

MEMORANDUM

RECEIVED

LID

TO: THE COMMISSION

2006 MAR 20 A 9:36

FROM: Utilities Division

AZ CORP COMMISSION  
DOCUMENT CONTROL


DATE: March 20, 2006


RE: REVISED OPINION AND ORDER IN THE MATER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR APPROVAL OF THE ENVIRONMENTAL PORTFOLIO STANDARD CREDIT PURCHASE PROGRAM AND FOR THE AUTHORIZATION TO ENTER INTO EPS CREDIT CONTRACTS (DOCKET NO. E-01345A-05-0373)

On February 28, 2006, Staff filed a memorandum and proposed opinion and order for the subject docket. Attached is the identical memorandum with a revised proposed opinion and order. The only differences between the February 28, 2006 proposed opinion and order and the attached revised decision are in the formatting, i.e., there are no substantive differences. The primary changes listed below were made to provide additional clarity to the decision. Therefore, please disregard and discard the February 28, 2006 proposed opinion and order.

Changes are:

- Findings of Fact Nos. 36 and 59 from the February 28, 2007 proposed opinion and order are removed.
- The last sentence of Finding of Fact No. 58 has been truncated after "Uniform Credit Purchase Program Working Group."
- New Findings of Fact Nos. 62 and 63 have been added to the new proposed opinion and order.
- A redlined version of APS' Exhibit A, which includes all of Staff's recommended changes, has been included as an attachment to the proposed opinion and order.

  
Ernest G. Johnson  
Director  
Utilities Division

Arizona Corporation Commission  
DOCKETED BY   
MAR 20 2006

EGJ:RTW:lmJFW

Attachments

ORIGINATOR: Ray Williamson

# OPEN MEETING

## MEMORANDUM RECEIVED

2005 FEB 28 A 11: 16

TO: THE COMMISSION

FROM: Utilities Division

AZ CORP COMMISSION  
DOCUMENT CONTROL

DATE: February 28, 2005

RE: IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR APPROVAL OF THE ENVIRONMENTAL PORTFOLIO STANDARD CREDIT PURCHASE PROGRAM AND FOR THE AUTHORIZATION TO ENTER INTO EPS CREDIT CONTRACTS (DOCKET NO. E-01345A-05-0373)

In 2002, Arizona Public Service Company ("APS") initiated the Environmental Portfolio Standard Credit Purchase Program ("EPS Credit Purchase Program") as part of its effort to meet the requirements of the Environmental Portfolio Standard ("EPS") Rule. From 2002 through 2005, a total of 538 APS customers installed solar energy systems in the EPS Credit Purchase Program, which helped APS to meet a portion of its annual EPS requirement. In general, these customers installed various qualifying renewable energy systems on their properties. APS reimbursed them a portion of the costs of these systems, and in return APS acquired the renewable energy credits associated with these systems. APS could then apply these credits to its environmental portfolio requirements.

On April 7, 2005, the Arizona Corporation Commission ("Commission") entered Decision No. 67744, which adopted a settlement agreement concerning APS' rate case. The decision provided that subsequent to the approval of the settlement, renewable programs that directly involve APS' retail customers must be submitted to the Commission for approval.

On May 25, 2005, APS filed an Application for Approval of the Environmental Portfolio Standard Credit Purchase Program and for Authorization to Enter into EPS Credit Purchase Contracts (the subject application).

On November 21, 2005, APS filed a request to amend the application by replacing Exhibit A with a revised version of Exhibit A.

### Proposed APS EPS Credit Purchase Program

The APS EPS Credit Purchase Program is one method by which APS can meet a portion of its annual renewable kWh requirement established in the Environmental Portfolio Standard. Instead of APS building renewable energy systems to meet the annual EPS requirement, APS offers incentives to customers who wish to install eligible renewable energy systems.

In return for the APS incentive, APS gets credit for the renewable kWh generated or conventional energy that is replaced with the customer-sited renewables. This credit helps APS meet its annual EPS requirement at a much lower cost than if APS had installed the renewable system itself.

The APS EPS Credit Purchase Program, as currently proposed, allows for four options for APS customers: 1) grid-tied photovoltaic systems; 2) off-grid photovoltaic systems; 3) solar water heating systems, and 4) solar heating, ventilation, and air conditioning ("HVAC") systems. An APS customer who wishes to install any of these types of systems may apply to APS for an incentive.

APS has established a reservation system by which qualifying APS customers may reserve program funding. Funds are made available for reservation on the first working day after January 1 of each year. Reservations for future years cannot be made. Multi-year reservations cannot be made.

For customers with photovoltaic systems and small water heating systems, the customer has 180 days from the date of the reservation confirmation to complete the installation. Customers may request extensions beyond the 180 days. If no extension is granted by APS, the funds will be made available to other customers.

For large solar water heating systems and solar air conditioning systems, the customer has 365 days from the date of the reservation confirmation to finish the installation. APS may allow extensions of this limit, if requested by the customer.

All systems must be installed by an Arizona-licensed contractor and inspected and approved by APS.

All systems eligible for credit purchase must be located on an APS customer's property, except for off-grid systems. Commercial systems may be owned by third parties and APS may, with customer consent, make payment to such third parties.

#### Grid-tied Photovoltaic Systems

In the grid-tied option, the customer's photovoltaic system is interconnected to the APS electric grid. The customer receives a one-time EPS credit purchase payment of \$3.00 per watt-DC. For system expansions, the payment is capped at 50 percent of the total expansion cost.

#### Off-grid Photovoltaic Systems

This option is available to both residential and commercial customers in remote areas that are not connected to the electric grid, but want to use solar energy to provide their electric power. APS makes this option available to non-APS customers who are remote residents in fringe areas that adjoin the APS service territory, as long as permission from the adjoining utility is obtained.

The participant receives a one-time EPS credit purchase payment of \$2.00 per watt-DC for the installation of an off-grid photovoltaic system, up to a maximum size of 5 kW.

#### Small Solar Water Heating Systems

The customer receives a one-time EPS credit purchase payment for the installation of a solar water heating system of \$0.50 per first-year kilowatt-hour savings based on the OG-300 rating from the Solar Rating and Certification Corporation<sup>1</sup>. The option is limited to systems rated at 10,000 kWh per year energy savings or less.

#### Large Solar Water Heating Systems

The commercial customer will receive a production-based incentive ("PBI") for the thermal energy delivered by a solar water heating system of \$0.07 per kilowatt-hour equivalent based on metered production in British Thermal Units ("BTUs"). The calculation for payment is the produced BTUs divided by 3,412 BTUs per kWh times \$0.07. The PBI is for a term of 10 years or until 50 percent of the total system cost is collected, whichever comes first. Payments are made at the end of each calendar quarter within 30 days of receipt of thermal meter readings provided by the customer. The minimum system size for this option is 5,000 kWh per year energy savings.

#### Solar HVAC Systems

This option is available to commercial customers to install a solar HVAC system. The customer will receive a PBI for thermal energy delivered for cooling by a solar HVAC system of \$0.16 per kilowatt-hour equivalent based on metered production. Systems that incorporate solar thermal heating and/or solar thermal water heating are eligible for the solar water heating PBI of \$0.07 per kilowatt-hour equivalent of thermal energy delivered for heating. The PBI is for the term of 10 years or until 50 percent of the total system cost is collected, whichever comes first. All heating and cooling payments are credited for calculation of the 50 percent cap. Payments are made at the end of each calendar quarter within 30 days of receipt of thermal meter readings, which are provided by the customer. The minimum system size is 10 tons of cooling. Cooling and heating must be metered and reported separately.

#### Dealers and Manufacturers of Photovoltaic Solar Energy Systems Requesting Incentives

Dealers and manufacturers of photovoltaic solar energy systems may apply for an EPS credit purchase agreement to install systems on their own facilities. APS has established various restrictions on the cost basis of the equipment. A dealer cannot profit from installing its own system on its facilities or include a mark-up for systems sold to itself or its employees. Dealers

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<sup>1</sup> The national Solar Rating and Certification Corporation ("SRCC") is a non-profit organization that develops and implements certification programs and national rating standards for solar energy equipment.

receive a one-time EPS credit purchase payment of \$3 per watt-DC or 50 percent of the system cost, whichever is less.

#### EPS Credit Purchase Contracts

In addition to the APS EPS Credit Purchase Program, APS has requested authorization to continue to enter into bi-lateral agreements to purchase EPS credits for energy generated from qualified renewable energy projects, other than through the EPS Credit Purchase Program. APS suggests that such authorization provides negotiating flexibility to both APS and its customers. Such flexibility will support and encourage the development of large renewable projects in the State of Arizona, according to APS.

#### Major Changes from the Existing APS EPS Credit Purchase Program

Since the original filing was made in May, APS has worked closely with a variety of stakeholders to establish a framework for an Arizona Uniform Credit Purchase Program ("UCPP"). The intent of the UCPP is to establish fundamental procedures for EPS credit purchases that can be implemented in a uniform manner throughout Arizona. The UCPP development is still ongoing, but APS has come to agreement with renewable industry members on some issues related to solar technologies.

APS has worked closely with the solar industry to modify the current APS Credit Purchase Program to reflect the new consensus with the solar industry that will likely become the foundation of the new UCPP effort. APS' November 21, 2005 proposed amendment incorporates a number of significant changes from the existing EPS Credit Purchase Program.

The APS-proposed incentive level for grid-tied photovoltaics is reduced from \$4.00 per watt-DC (which is in the current APS EPS Credit Purchase Program) to \$3.00 per watt-DC.

The APS-proposed incentive for small solar water heating systems is changed from a \$700 per system flat incentive (in the existing program) to an incentive that is set at \$0.50 per first year kilowatt-hour savings based upon certified ratings.

The APS proposal sets a \$500,000 cap on incentive payouts to any single customer in a calendar year.

The proposal introduces a new production based incentive ("PBI") for solar heating, ventilation, and air conditioning ("HVAC") systems as well as large commercial water heating systems. Under the PBI approach, customers will receive quarterly payments for the amount of thermal energy produced over a period of up to 10 years.

APS plans to allocate \$4.25 million to this program in 2006. Half of the funds will be allocated to residential customers and half to commercial customers. A sum of \$250,000 from

the commercial funds will be reserved for customers with photovoltaic systems that are willing to negotiate a PBI in lieu of an up-front incentive.

Staff's Review of the APS Application and Program

Staff has reviewed the APS application and is in general support of the program, with a few recommendations.

Staff recognizes that the revised APS Environmental Portfolio Standard Credit Purchase Program is a significant improvement over the existing APS program. APS has worked cooperatively with the solar industry to establish a common foundation for EPS credit purchases.

Staff supports the APS effort to establish production-based incentives. This is a new concept in Arizona. Until now, the primary incentives have been up-front incentives which help the customer "buy-down" the cost of installing a renewable system. This is advantageous to the customer who might not have the initial capital to buy and install a renewable energy system. However, the up-front incentive requires APS to buy, in effect, 20-30 years of future renewable kWh in a one-time payment.

The PBI approach allows APS to purchase only the renewable kWh that are needed in the current year, allowing APS to purchase many more renewable kWh for a given amount of portfolio funding. For instance, for the same amount of money used to offer an up-front incentive for six projects, APS could offer a PBI incentive for a dozen or possibly two dozen projects producing significantly more kWh in a given year.

Staff supports the APS effort to allocate \$250,000 from the commercial funds for PBI incentives. Staff believes that the allocation for PBIs should not be limited to photovoltaics, but should also be available for solar water heating and solar HVAC systems to qualify for PBI incentives in the 2006 program.

Staff recommends that APS subdivide the \$250,000 for PBIs into three allocations. That would be \$150,000 for photovoltaics and \$50,000 each for solar HVAC and solar water heating. If, by September 30, 2006, all of the funds in any of the three allocations are not yet reserved, the remaining money shall be made available to other customers.

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Staff recommends denial of the request for authorization to enter into bi-lateral agreements at this time. Based upon inclusion of a Uniform Credit Purchase Program Section in the proposed EPS Rule amendments, Staff believes that by the end of 2006 there should be



established a uniform credit purchase requirement. At that time, APS may choose to request approval for authorization to enter into bi-lateral agreements consistent with the approved Uniform Credit Purchase Program. APS may, of course, request approval of individual agreements on a case-by-case basis. APS also may file subsequent applications to expand the programs and/or technologies that comprise its credit purchase program.

APS has indicated that there was a typographical error on the bottom line of Page 6 of the November 21, 2005 revised Exhibit A. The small solar water heating system option is limited to systems rated at 10,000 kWh per year energy savings or less, rather than the mistaken amount of 100,000 kWh per year.

#### Comments Filed in the Docket

On June 20, 2005, the Arizona Solar Energy Industries Association ("AriSEIA") filed comments on the initial May 25, 2005 APS filing. AriSEIA recommended, at that time, that the incentive for solar water heaters be set at an upfront incentive of \$1 per first-year kWh saved or one-half of the cost of the system. After AriSEIA met with APS, AriSEIA filed comments on December 8, 2005, responding to the November 21, 2005 APS-revised Exhibit A. In this letter, AriSEIA requested that the Commission approve the revised EPS Credit Purchase Program as filed by APS with an incentive of \$0.50 per first-year kWh saved.

In addition to AriSEIA, three other solar industry individuals and organizations filed comments. They were: Robert Annan, Industrial Solar Technology Corporation, and Kyocera Solar, Inc. All three letters were in support of the proposed APS EPS Credit Purchase Program.

The Greater Tucson Coalition for Solar Energy ("GTCSE") also filed comments, which encouraged the Commission to approve the program. However, GTCSE offered three recommendations. First, GTCSE did not like the \$500,000 annual cap on incentives to any single customer in a single year. It suggested that the limit be lifted for public institutions such as governments and schools. Second, GTCSE suggested that implementation of production based incentives "be tied to the capacity of financing entities to monetize the payments and assume the necessary up-front capital." Third, GTCSE recommended a timeline longer than 365 days for large projects or a mechanism for easy extension.

The City of Tucson filed a letter that was "in general support of the program," but offered some comments. Tucson believes that negotiating for production-based incentives is inconsistent with a Uniform Credit Purchase program. Tucson does not agree with an annual cap on incentives. Tucson suggested that projects needing an incentive above the cap should submit a proposal to the ACC for consideration. Tucson recommended against incentives for off-grid applications. Tucson also recommended that solar water heating systems should be allowed to replace natural gas.

S.O.L.I.D. USA, Inc. ("S.O.L.I.D.") filed comments in support of the proposed APS EPS Credit Purchase Program. However, S.O.L.I.D. also requested clarification of a number of issues related to the program.

S.O.L.I.D. comments that APS proposes that the "credit purchase agreement assigns the rights to all associated EPS credits." S.O.L.I.D. suggests that the program wording be changed to show that the credit purchase agreement assigns the rights to all associated EPS credits for which APS pays during the contract period and not for the entire life of the project.

S.O.L.I.D. further commented that on Page 3 of Exhibit A, APS specifies that systems "must be located on APS customer's property." S.O.L.I.D. requested that the wording be changed to "must be located on an APS customer's property or supply a central plant that generates energy for an APS customer."

S.O.L.I.D. mentions that the Large Solar Water Heating section of the proposed program mentions the "two customers per calendar year and a maximum of 60,000 therms per calendar year" restriction for projects that displace natural gas. This restriction was included in the waiver approved by the Commission in Decision No. 66565, dated November 13, 2003. S.O.L.I.D. asked for clarification that the restriction applies to hot water projects only and not to HVAC projects.

S.O.L.I.D. also asked for clarification of wording on Page 8 of Exhibit A that says that program incentives are "available to commercial customers to replace" certain systems. S.O.L.I.D. requests clarification that the term "replace" does not restrict the program to retrofits, but also allows new installations.

Finally, S.O.L.I.D. asks for clarification of wording on Page 8 of Exhibit A that says "replace an electric HVAC system." S.O.L.I.D. asks for clarification that a solar HVAC system must replace electricity for cooling, but can displace natural gas for both associated heating and hot water.

#### Comments Provided to Staff

Although he did not file written comments in the docket, Mr. Tom Bohner of Sun Systems, Inc. called Staff to express concern about the fact that APS would be using a performance-based incentive for small solar water heaters rather than a flat fee incentive. Mr. Bohner's concern was that such a performance-based incentive may cause dealers and customers to oversize systems and include the most efficient black chrome collectors which could cause system problems due to overheating. He contends that such overheating may cause future system damage, requiring future repair or replacement of equipment.

Staff Review of Comments Received

Staff has reviewed the comments filed in this docket. Staff supports the \$500,000 annual cap. This is a reasonable cap when the current budget is \$4.25 million. Without such a cap, four or fewer large customers could lock up most of the non-residential money in the reservation system, leaving many smaller customers without a chance to participate. Staff recommends that the Commission allow APS, if increased funds become available, to increase the cap if there is demand for such an increase and if sufficient funding is available after all other reservation commitments have been satisfied.

Staff supports the modest level of PBI reservation funding. This effort by APS will provide a test of whether customers really want such an incentive, rather than an upfront buy-down incentive.

Staff supports the APS 365-day timeline for larger projects, at this time. If more funding becomes available, the proposed Uniform Credit Purchase Program may be able to address this issue for future years.

Staff disagrees with the City of Tucson on incentives for off-grid applications. Off-grid applications, particularly in remote locations, will avoid the need for utilities or customers to build long distribution lines.

Staff agrees with the City of Tucson that solar water heating that replaces natural gas should be allowed in the Portfolio Standard. However, this is better addressed in the amended EPS Rules process. APS has already been granted a waiver that allows solar water heaters to replace natural gas in Decision No. 66565, dated November 18, 2003.

Staff agrees with S.O.L.I.D. that the program wording should be changed to indicate that the purchase agreement assigns all associated EPS credits for which APS pays during the contract period.

Staff has reviewed S.O.L.I.D.'s request to change the wording on Page 3 of Exhibit A that currently reads "must be located at customer's property." In response to S.O.L.I.D.'s proposed revised wording, APS has countered with a different approach. APS suggested the revision should say "must be located on an APS customer's property or supply a central plant that generates energy exclusively for APS customers." Staff believes that the S.O.L.I.D. wording is the better approach. Staff believes that using the new APS-proposed wording would preclude potential future large-scale district heating and cooling projects, where customers other than APS customers could participate. Staff recommends the inclusion of the S.O.L.I.D. wording, which would be followed by wording that would require additional metering for non-APS customers that may participate in the project.

Staff agrees with S.O.L.I.D. that clarification to the restrictions in Decision No. 66565 may be beneficial, but Staff believes that this issue should not be addressed in this docket.

Staff agrees with S.O.L.I.D. that the APS EPS Credit Purchase Program should clarify that new construction should be allowed.

Staff disagrees with S.O.L.I.D. that the program should say that a solar HVAC system must replace electricity for cooling, but can displace natural gas for both associated heating and hot water heating. This clarification goes beyond the scope of this docket and should be addressed in the current rule amendment docket.

Staff has considered the concerns expressed by Sun Systems, Inc. Although there may be some problems that result from the APS-proposed solar water heating incentive, it is too soon to know the scope of any potential problems. Staff recommends that APS be allowed to offer the proposed performance-based solar water heater incentive for the entire 2006 calendar year. This issue should be examined by the Uniform Credit Purchase Program Working Group, and APS should be required to refile its credit purchase plan in order to incorporate any results from that process.

#### Staff Recommendations

Staff recommends that the APS EPS Credit Purchase Program be approved, with some recommended changes.

Staff recommends that the funding reserved for production based incentives be allocated as \$150,000 for photovoltaics and \$50,000 each for solar HVAC systems and solar water heating systems. If, by September 30, 2006, all of the funds in any allocation are not yet reserved, the remaining money made available to other customers.

Staff recommends approval of the \$500,000 cap on annual incentive payments to any single customer, but recommends that the Commission allow APS, if increased funding becomes available, to increase the annual cap if there is demand for such an increase and if sufficient funding is available after all other reservation commitments have been satisfied.

Based upon suggestions made by S.O.L.I.D. USA, Inc., Staff recommends that APS modify the wording in Exhibit A of its November 21, 2005 filing as follows.

In the "General Requirements" section, Page 3 of Exhibit A, first paragraph, APS shall add a final sentence that says:

"The assignment of the associated EPS credits and environmental attributes to APS shall only apply to the contract period for which APS pays the customer."

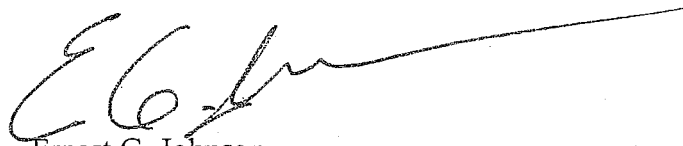
On Page 3, last paragraph, APS shall modify the first sentence and add an additional sentence following the first sentence that says:

“All systems eligible for credit purchase must be located on an APS customer’s property or supply a central plant that generates energy for an APS customer, except for off-grid systems. Any project developer that builds an eligible system that also provides energy to a non-APS customer must provide metering to document the energy received by each customer.”

On Page 8, under Section 8, Solar HVAC Systems, the first bullet under “Qualifications for Solar Air Conditioning Systems,” shall be changed to read:

- “• This option is available to commercial customers and must replace an electric HVAC system, another HVAC system approved by the ACC, and may be used for new construction if not prohibited by another Commission Decision or waiver restriction.”

Staff further recommends denial of APS’ request for authorization to enter into bilateral agreements with customers to purchase EPS Credits for energy generated from qualified renewable energy projects that are not included in the APS EPS Credit Purchase Program. APS may, however, request approval of individual agreements on a case-by-case basis. APS also may file subsequent applications to expand the programs and technologies that comprise its credit purchase program.



Ernest G. Johnson  
Director  
Utilities Division

EGJ:RTW:lhm\JFW

ORIGINATOR: Ray Williamson

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**BEFORE THE ARIZONA CORPORATION COMMISSION**

JEFF HATCH-MILLER  
Chairman  
WILLIAM A. MUNDELL  
Commissioner  
MARC SPITZER  
Commissioner  
MIKE GLEASON  
Commissioner  
KRISTIN K. MAYES  
Commissioner

IN THE MATTER OF THE APPLICATION )  
OF ARIZONA PUBLIC SERVICE )  
COMPANY FOR APPROVAL OF THE )  
ENVIRONMENTAL PORTFOLIO )  
STANDARD CREDIT PURCHASE )  
PROGRAM AND FOR THE )  
AUTHORIZATION TO ENTER INTO EPS )  
CREDIT CONTRACTS )

DOCKET NO. E-01345A-05-0373  
DECISION NO. \_\_\_\_\_  
ORDER

Open Meeting  
April 4 and 5, 2006  
Phoenix, Arizona

BY THE COMMISSION:

FINDINGS OF FACT

1. Arizona Public Service Company ("APS") is certificated to provide electric service as a public service corporation in the State of Arizona.
2. In 2002, APS initiated the Environmental Portfolio Standard Credit Purchase Program ("EPS Credit Purchase Program") as part of its effort to meet the requirements of the Environmental Portfolio Standard ("EPS") Rule. From 2002 through 2005, a total of 538 APS customers installed solar energy systems in the EPS Credit Purchase Program, which helped APS to meet a portion of its annual EPS requirement. In general, these customers installed various qualifying renewable energy systems on their properties. APS reimbursed them a portion of the costs of these systems, and in return APS acquired the renewable energy credits associated with these systems. APS could then apply these credits to its environmental portfolio requirements.

1           3.       On April 7, 2005, the Arizona Corporation Commission (“Commission”) entered  
2 Decision No. 67744, which adopted a settlement agreement concerning APS’ rate case. The  
3 decision provided that subsequent to the approval of the settlement, renewable programs that  
4 directly involve APS’ retail customers must be submitted to the Commission for approval.

5           4.       On May 25, 2005, APS filed an Application for Approval of the Environmental  
6 Portfolio Standard Credit Purchase Program and for Authorization to Enter into EPS Credit  
7 Purchase Contracts (the subject application).

8           5.       On November 21, 2005, APS filed a request to amend the application by replacing  
9 Exhibit A with a revised version of Exhibit A.

10  
11 Proposed APS EPS Credit Purchase Program

12           6.       The APS EPS Credit Purchase Program is one method by which APS can meet a  
13 portion of its annual renewable kWh requirement established in the Environmental Portfolio  
14 Standard. Instead of APS building renewable energy systems to meet the annual EPS requirement,  
15 APS offers incentives to customers who wish to install eligible renewable energy systems.

16           7.       In return for the APS incentive, APS gets credit for the renewable kWh generated  
17 or conventional energy that is replaced with the customer-sited renewables. This credit helps APS  
18 meet its annual EPS requirement at a much lower cost than if APS had installed the renewable  
19 system itself.

20           8.       The APS EPS Credit Purchase Program, as currently proposed, allows for four  
21 options for APS customers: 1) grid-tied photovoltaic systems; 2) off-grid photovoltaic systems; 3)  
22 solar water heating systems, and 4) solar heating, ventilation, and air conditioning (“HVAC”)  
23 systems. An APS customer who wishes to install any of these types of systems may apply to APS  
24 for an incentive.

25           9.       APS has established a reservation system by which qualifying APS customers may  
26 reserve program funding. Funds are made available for reservation on the first working day after  
27 January 1 of each year. Reservations for future years cannot be made. Multi-year reservations  
28 cannot be made.

1           10. For customers with photovoltaic systems and small water heating systems, the  
2 customer has 180 days from the date of the reservation confirmation to complete the installation.  
3 Customers may request extensions beyond the 180 days. If no extension is granted by APS, the  
4 funds will be made available to other customers.

5           11. For large solar water heating systems and solar air conditioning systems, the  
6 customer has 365 days from the date of the reservation confirmation to finish the installation. APS  
7 may allow extensions of this limit, if requested by the customer.

8           12. All systems must be installed by an Arizona-licensed contractor and inspected and  
9 approved by APS.

10           13. All systems eligible for credit purchase must be located on an APS customer's  
11 property, except for off-grid systems. Commercial systems may be owned by third parties and  
12 APS may, with customer consent, make payment to such third parties.

13

14 Grid-tied Photovoltaic Systems

15           14. In the grid-tied option, the customer's photovoltaic system is interconnected to the  
16 APS electric grid. The customer receives a one-time EPS credit purchase payment of \$3.00 per  
17 watt-DC. For system expansions, the payment is capped at 50 percent of the total expansion cost.

18

19 Off-grid Photovoltaic Systems

20           15. This option is available to both residential and commercial customers in remote  
21 areas that are not connected to the electric grid, but want to use solar energy to provide their  
22 electric power. APS makes this option available to remote residents in fringe areas that adjoin the  
23 APS service territory, as long as permission from the adjoining utility is obtained. The participant  
24 receives a one-time EPS credit purchase payment of \$2.00 per watt-DC for the installation of an  
25 off-grid photovoltaic system, up to a maximum size of 5 kW.

26 ...

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28 ...



1 Small Solar Water Heating Systems

2           16.     The customer receives a one-time EPS credit purchase payment for the installation  
3 of a solar water heating system of \$0.50 per first-year kilowatt-hour savings based on the OG-300  
4 rating from the Solar Rating and Certification Corporation<sup>1</sup>. The option is limited to systems rated  
5 at 10,000 kWh per year energy savings or less.

6  
7 Large Solar Water Heating Systems

8           17.     The commercial customer will receive a production-based incentive ("PBI") for the  
9 thermal energy delivered by a solar water heating system of \$0.07 per kilowatt-hour equivalent  
10 based on metered production in British Thermal Units ("BTUs"). The calculation for payment is  
11 the produced BTUs divided by 3,412 BTUs per kWh times \$0.07. The PBI is for a term of 10  
12 years or until 50 percent of the total system cost is collected, whichever comes first. Payments are  
13 made at the end of each calendar quarter within 30 days of receipt of thermal meter readings  
14 provided by the customer. The minimum system size for this option is 5,000 kWh per year energy  
15 savings.

16  
17 Solar HVAC Systems

18           18.     This option is available to commercial customers to install a solar HVAC system.  
19 The customer will receive a PBI for thermal energy delivered for cooling by a solar HVAC system  
20 of \$0.16 per kilowatt-hour equivalent based on metered production. Systems that incorporate solar  
21 thermal heating and/or solar thermal water heating are eligible for the solar water heating PBI of  
22 \$0.07 per kilowatt-hour equivalent of thermal energy delivered for heating. The PBI is for the  
23 term of 10 years or until 50 percent of the total system cost is collected, whichever comes first.  
24 All heating and cooling payments are credited for calculation of the 50 percent cap. Payments are  
25 made at the end of each calendar quarter within 30 days of receipt of thermal meter readings,  
26  
27

28 <sup>1</sup> The national Solar Rating and Certification Corporation ("SRCC") is a non-profit organization that develops and implements certification programs and national rating standards for solar energy equipment.

1 which are provided by the customer. The minimum system size is 10 tons of cooling. Cooling and  
2 heating must be metered and reported separately.

3

4 Dealers and Manufacturers of Photovoltaic Solar Energy Systems

5 19. Dealers and manufacturers of photovoltaic solar energy systems may apply for an  
6 EPS credit purchase agreement. APS has established various restrictions on the cost basis of the  
7 equipment. A dealer cannot profit from installing its own system on its facilities or include a  
8 mark-up for systems sold to itself or its employees. Dealers receive a one-time EPS credit  
9 purchase payment of \$3 per watt-DC or 50 percent of the system cost whichever is less.

10

11 EPS Credit Purchase Contracts

12 20. In addition to the APS EPS Credit Purchase Program, APS has requested  
13 authorization to continue to enter into bi-lateral agreements to purchase EPS credits for energy  
14 generated from qualified renewable energy projects, other than through the EPS Credit Purchase  
15 Program. APS suggests that such authorization provides negotiating flexibility to both APS and its  
16 customers. Such flexibility will support and encourage the development of large renewable  
17 projects in the State of Arizona, according to APS.

18

19 Major Changes from the Existing APS EPS Credit Purchase Program

20 21. Since the original filing was made in May, APS has worked closely with a variety  
21 of stakeholders to establish a framework for an Arizona Uniform Credit Purchase Program  
22 ("UCPP"). The intent of the UCPP is to establish fundamental procedures for EPS credit  
23 purchases that can be implemented in a uniform manner throughout Arizona. The UCPP  
24 development is still ongoing, but APS has come to agreement with renewable industry members  
25 on some issues related to solar technologies.

26 ...

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28 ...

1           22.     APS has worked closely with the solar industry to modify the current APS Credit  
2 Purchase Program to reflect the new consensus with the solar industry that will likely become the  
3 foundation of the new UCPP effort. APS' November 21, 2005 proposed amendment incorporates  
4 a number of significant changes.

5           23.     The APS-proposed incentive level for grid-tied photovoltaics is reduced from \$4.00  
6 per watt-DC (which is in the current APS EPS Credit Purchase Program) to \$3.00 per watt-DC.

7           24.     The APS-proposed incentive for small solar water heating systems is changed from  
8 a \$700 per system flat incentive (in the existing program) to an incentive that is set at \$0.50 per  
9 first year kilowatt-hour savings based upon certified ratings.

10          25.     The APS proposal sets a \$500,000 cap on incentive payouts to any single customer  
11 in a calendar year.

12          26.     The proposal introduces a new production based incentive ("PBI") for solar heating,  
13 ventilation, and air conditioning ("HVAC") systems as well as large commercial water heating  
14 systems. Under the PBI approach, customers will receive quarterly payments for the amount of  
15 thermal energy produced over a period of up to 10 years.

16          27.     APS plans to allocate \$4.25 million to this program in 2006. Half of the funds will  
17 be allocated to residential customers and half to commercial customers. A sum of \$250,000 from  
18 the commercial funds will be reserved for customers with photovoltaic systems that are willing to  
19 negotiate a PBI in lieu of an up-front incentive.

20  
21 Staff's Review of the APS Application and Program

22          28.     Staff has reviewed the APS application and is in general support of the program,  
23 with a few recommendations.

24          29.     Staff recognizes that the revised APS Environmental Portfolio Standard Credit  
25 Purchase Program is a significant improvement over the existing APS program. APS has worked  
26 cooperatively with the solar industry to establish a common foundation for EPS credit purchases.

27          30.     Staff supports the APS effort to establish production-based incentives. This is a  
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1 help the customer "buy-down" the cost of installing a renewable system. This is advantageous to  
2 the customer who might not have the initial capital to buy and install a renewable energy system.  
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5 31. The PBI approach allows APS to purchase only the renewable kWh that are needed  
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10 32. Staff supports the APS effort to allocate \$250,000 from the commercial funds for  
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14 33. Staff recommends that APS subdivide the \$250,000 for PBIs into three allocations.  
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18 34. In the original APS application, APS requested authorization to continue to enter  
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20 eligible renewable energy resources which are not included in the 2006 APS EPS Credit Purchase  
21 Program. This request is really separate and distinctly different than the major request in the  
22 application which was to approve the 2006 EPS Credit Purchase Program.

23 35. Staff recommends denial of the request for authorization to enter into bi-lateral  
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27 approval for authorization to enter into bi-lateral agreements consistent with the approved Uniform  
28 Credit Purchase Program. APS may, of course, request approval of individual agreements on a

1 case-by-case basis. APS also may file subsequent applications to expand the programs and/or  
2 technologies that comprise its credit purchase program.

3  
4 Comments Filed in the Docket

5 36. On June 20, 2005, the Arizona Solar Energy Industries Association ("AriSEIA")  
6 filed comments on the initial May 25, 2005 APS filing. AriSEIA recommended, at that time, that  
7 the incentive for solar water heaters be set at an upfront incentive of \$1 per first-year kWh saved or  
8 one-half of the cost of the system. After AriSEIA met with APS, AriSEIA filed comments on  
9 December 8, 2005, responding to the November 21, 2005 APS-revised Exhibit A. In this letter,  
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24 45. Finally, S.O.L.I.D. asks for clarification of wording on Page 8 of Exhibit A that  
25 says "replace an electric HVAC system." S.O.L.I.D. asks for clarification that a solar HVAC  
26 system must replace electricity for cooling, but can displace natural gas for both associated heating  
27 and hot water.

28 ...

1 Comments Provided to Staff

2 46. Although he did not file written comments in the docket, Mr. Tom Bohner of Sun  
3 Systems, Inc. called Staff to express concern about the fact that APS would be using a  
4 performance-based incentive for small solar water heaters rather than a flat fee incentive.  
5 Mr. Bohner's concern was that such a performance-based incentive may cause dealers and  
6 customers to oversize systems and include the most efficient black chrome collectors which could  
7 cause system problems due to overheating. He contends that such overheating may cause future  
8 system damage, requiring future repair or replacement of equipment.

9

10 Staff Review of Comments Received

11 47. Staff has reviewed the comments filed in this docket. Staff supports the \$500,000  
12 annual cap. This is a reasonable cap when the current budget is \$4.25 million. Without such a  
13 cap, four or fewer large customers could lock up most of the non-residential money in the  
14 reservation system, leaving many smaller customers without a chance to participate. Staff  
15 recommends that the Commission allow APS, if increased funds become available, to increase the  
16 cap if there is demand for such an increase and if sufficient funding is available after all other  
17 reservation commitments have been satisfied.

18 48. Staff supports the modest level of PBI reservation funding. This effort by APS will  
19 provide a test of whether customers really want such an incentive, rather than an upfront buy-down  
20 incentive.

21 49. Staff supports the APS 365-day timeline for larger projects, at this time. If more  
22 funding becomes available, the proposed Uniform Credit Purchase Program may be able to address  
23 this issue for future years.

24 50. Staff disagrees with the City of Tucson on incentives for off-grid applications. Off-  
25 grid applications, particularly in remote locations, will avoid the need for utilities or customers to  
26 build long distribution lines.

27 51. Staff agrees with the City of Tucson that solar water heating that replaces natural  
28 gas should be allowed in the Portfolio Standard. However, this is better addressed in the amended

1 EPS Rules process. APS has already been granted a waiver that allows solar water heaters to  
2 replace natural gas in Decision No. 66565, dated November 18, 2003.

3 52. Staff agrees with S.O.L.I.D. and recommends that the program wording be changed  
4 to indicate that the purchase agreement assign all associated EPS credits for which APS pays  
5 during the contract period.

6 53. Staff has reviewed S.O.L.I.D.'s request to change the wording on Page 3 of Exhibit  
7 A that currently reads "must be located at customer's property." In response to S.O.L.I.D.'s  
8 proposed revised wording, APS has countered with a different approach. APS suggested the  
9 revision should say "must be located on an APS customer's property or supply a central plant that  
10 generates energy exclusively for APS customers." Staff believes that the S.O.L.I.D. wording is the  
11 better approach. Staff believes that using the new APS-proposed wording would preclude  
12 potential future large-scale district heating and cooling projects, where customers other than APS  
13 customers could participate. Staff recommends the inclusion of the S.O.L.I.D. wording, which  
14 would be followed by wording that would require additional metering for non-APS customers that  
15 may participate in the project.

16 54. Staff agrees with S.O.L.I.D. that clarification to the restrictions in Decision  
17 No. 66565 may be beneficial, but Staff believes that this issue should not be addressed in this  
18 docket.

19 55. Staff agrees with S.O.L.I.D. and recommends that the APS EPS Credit Purchase  
20 Program clarify that new construction should be allowed.

21 56. Staff disagrees with S.O.L.I.D. that the program should say that a solar HVAC  
22 system must replace electricity for cooling, but can displace natural gas for both associated heating  
23 and hot water heating. This clarification goes beyond the scope of this docket and should be  
24 addressed in the current rule amendment docket.

25 57. Staff has considered the concerns expressed by Sun Systems, Inc. Although there  
26 may be some problems that result from the APS-proposed solar water heating incentive, it is too  
27 soon to know the scope of any potential problems. Staff recommends that APS be allowed to offer  
28 ...



1 the proposed performance-based solar water heater incentive for the entire 2006 calendar year.

2 This issue should be examined by the Uniform Credit Purchase Program Working Group.

3 Staff Recommendations

4 58. Staff recommends that the funding reserved for production based incentives be  
5 allocated as \$150,000 for photovoltaics and \$50,000 each for solar HVAC systems and solar water  
6 heating systems. If, by September 30, 2006, all of the funds in any allocation are not yet reserved,  
7 the remaining money shall be made available to other customers.

8 59. Staff recommends approval of the \$500,000 cap on annual incentive payments to  
9 any single customer, but recommends that the Commission allow APS, if increased funding  
10 becomes available, to increase the annual cap if there is demand for such an increase and if  
11 sufficient funding is available after all other reservation commitments have been satisfied.

12 60. Staff recommends that APS modify the wording in Exhibit A of its November 21,  
13 2005, filing as follows:

14 In the "General Requirements" section, Page 3 of Exhibit A, first  
15 paragraph, APS shall add a final sentence that says:

16 "The assignment of the associated EPS credits and environmental  
17 attributes to APS shall only apply to the contract period for which  
18 APS pays the customer."

19 On Page 3, last paragraph, APS shall modify the first sentence and add an  
20 additional sentence following the first sentence that says:

21 "All systems eligible for credit purchase must be located on an  
22 APS customer's property or supply a central plant that generates  
23 energy for an APS customer, except for off-grid systems. Any  
24 project developer that builds an eligible system that also provides  
25 energy to a non-APS customer must provide metering to document  
26 the energy received by each customer."

27 On Page 8, under Section E, Solar HVAC Systems, the first bullet under  
28 "Qualifications for Solar Air Conditioning Systems," shall be changed to read:

"• This option is available to commercial customers and must  
replace an electric HVAC system, another HVAC system  
approved by the ACC, and may be used for new construction if  
not prohibited by another Commission Decision or waiver  
restriction."



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IT IS FURTHER ORDERED that APS submit to Docket Control, within 15 days of a decision in this matter, a new Exhibit A adopting the changes discussed herein and as shown in the attached redlined Exhibit A.

IT IS FURTHER ORDERED that this Order shall become effective immediately.

**BY THE ORDER OF THE ARIZONA CORPORATION COMMISSION**

CHAIRMAN	COMMISSIONER
COMMISSIONER	COMMISSIONER
	COMMISSIONER

IN WITNESS WHEREOF, I BRIAN C. McNEIL, Executive Director of the Arizona Corporation Commission, have hereunto, set my hand and caused the official seal of this Commission to be affixed at the Capitol, in the City of Phoenix, this \_\_\_\_\_ day of \_\_\_\_\_, 2006.

\_\_\_\_\_  
BRIAN C. McNEIL  
Executive Director

DISSENT: \_\_\_\_\_

DISSENT: \_\_\_\_\_

EGJ:RTW:lhmvJFW

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**Exhibit A****Arizona Public Service Corporation****Environmental Portfolio Standard Credit Purchase Program****Overview of Program**

In February 2001, the Arizona Corporation Commission (ACC) adopted the Environmental Portfolio Standard (EPS), which established goals for Arizona retail electricity providers to generate a percentage of their electricity from renewable resources. The standard also added a surcharge to customer's bills to pay for the new program. The EPS requires that a minimum of 60% of the renewable energy goal be provided from solar electric resources by 2007.

APS offers customers, who have new solar systems installed, the opportunity to sell to APS the EPS credits<sup>1</sup> and environmental attributes associated with the energy generated by the system. These credits are utilized to meet APS' EPS requirement in exchange for a payment to the customer.

The EPS Credit Purchase Program provides several different options for APS customers: 1) grid-tied photovoltaic systems; 2) off-grid photovoltaic systems, 3) solar water heating systems, and 4) solar heating, ventilation, and air conditioning (HVAC) systems. APS also has an option for solar energy system dealers and manufacturers. The energy that is generated by a customer's system is credited toward APS' requirement for renewable energy resources under the Arizona Corporation Commission's rules.<sup>2</sup> The solar water heating systems are applied towards the "other" category and the photovoltaic

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<sup>1</sup> "EPS Credit" is defined as the number of eligible kWh (after appropriate extra-credit multipliers are applied) to be used to meet a utility's EPS requirement. Eligible kWh is defined as energy purchased or produced from a system or technology that qualifies under the EPS Rules and is available to displace customer's use of electricity or gas.

<sup>2</sup> A.A.C. R14-2-1618.

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systems and solar HVAC systems<sup>3</sup> are applied towards the solar electric category. The total annual benefit to any one customer is limited to \$500,000.

**General Requirements**

To ensure that the new system complies with the EPS Credit Purchase program requirements and that funds are available for the installation, a customer should reserve funding for the installation. Funds are made available for reservation on the first working day after January 1 of each year. Reservations can not be made for future years, nor can multi-year reservations be made. Funding is not guaranteed without an EPS reservation. The customer selects the system that meets their needs and obtains complete pricing information from their dealer/installer. After selection of the system, the customer must provide APS with relevant information, including a price quote from the dealer/installer. APS' reservation forms are available at [www.aps.com/eps](http://www.aps.com/eps). Once a customer has received confirmation and written verification from APS that the Company will purchase the EPS Credits, the installation process begins.

For photovoltaic systems and small water heating systems, the customer has 180 days from the date on the reservation confirmation to complete the installation. Upon request from the customer, APS will grant extensions of the 180 day requirement caused by delays beyond the customer's control. After 180 days the reserved funding will be made available to other customers seeking reservations, unless an extension has been granted. Upon completion of the installation by an Arizona-licensed contractor, the grid-tied system is inspected and approved by APS. Within 180 days of installation, the customer must notify APS and submit an executed credit purchase agreement, such as

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<sup>3</sup> Only solar HVAC systems eligible to meet a portion of the "solar electric" requirement under the EPS as approved by ACC Decision No. 67402, dated November 2, 2004 or future related ACC orders are eligible for APS' credit purchase program.

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that available at [www.aps.com/eps](http://www.aps.com/eps), and, where applicable, verification of an APS interconnection agreement, as well as the receipts confirming the system purchase price, financing costs (if applicable), payment and installation by an Arizona-licensed contractor. The customer will then receive payment from APS. The EPS Credit Purchase Agreement assigns the rights to all associated EPS credits and environmental attributes to APS and allows the system to be used by APS in meeting its EPS requirements. The assignment of the associated EPS credits and environmental attributes to APS shall only apply to the contract period for which APS pays the customer.

For large solar water heating systems and solar air conditioning systems, the customer has 365 days from the date of the reservation confirmation to complete the installation. Upon request from the customer, APS will grant extensions at its discretion.

Upon completion of the installation by an Arizona-licensed contractor, the system is inspected and approved by APS. Prior to completion or up to 180 days after of installation, the customer/or system owner must execute a credit purchase agreement with APS. The customer will then begin receiving payments from APS on the schedule described later in this document. The credit purchase agreement assigns the rights to all associated EPS credits and environmental attributes to APS and allows the system to be used by APS in meeting its EPS requirements.

All systems eligible for credit purchase must be located on an APS customer's property or supply a central plant that generates energy for an APS customer, except for off-grid systems. Any project developer that builds an eligible system that also provides energy to a non-APS customer must provide metering to document the energy received by each customer. Commercial systems may be owned by third parties, and APS may make payments to such third parties with written consent of the APS customer. Residential customers may assign payment only to an installer, dealer or manufacturer.



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For both residential and commercial systems, payments to third parties can only be executed after written acceptance of the system by the APS customer and execution of a credit purchase agreement with APS.

**Consumer Options**

**A. Grid-tied Photovoltaic Systems.**

With the grid-tied option, a participating customer's photovoltaic system is interconnected to the APS electric grid. The customer receives a one-time EPS Credit Purchase payment of \$3.00 per watt-DC (based on the manufacturer's rating) for purchasing and installing the system. For system expansions, payment is capped at 50% of the total cost for expansion.

For example, customers installing a new 1,000-watt solar system on their home will receive a one-time payment of \$3,000 from APS. To ensure funding is available, customers must reserve the EPS Credit Purchase funds prior to installing their system. Customers that apply for funding after the installation or after contracting with a contractor will only receive funding if it is available at that time.

To protect the reliability of APS' system and the safety of its employees, in addition to the requirement that the system be installed by an Arizona-licensed contractor, the customer is also required to execute an interconnection agreement, which addresses operational and safety standards. Beginning in 2005, each customer is required to report the total system performance to APS on an annual basis. Systems are not limited in size.

**Qualifications for Grid-tied Option:**

- This option is available to both residential and commercial customers who purchase a complete photovoltaic solar system or expand an existing

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photovoltaic solar system with all new components. A complete solar electric system includes solar panels, inverter, and other related equipment to provide AC electricity to a customer site.

- Installations must meet APS interconnection requirements.
- Customers must sign an interconnection agreement with APS.
- The system must use UL-rated components and meet IEEE 929 specifications.
- An Arizona-licensed contractor must install the system.
- The customer must provide a separate meter for the solar system, and it must be placed adjacent to the existing APS meter and marked "solar meter."
- The system generation (kWh) must be reported annually to APS.

In addition to the one-time payment option, APS will reserve a portion of the funding for commercial grid-tied photovoltaic systems that are willing to contract with APS for credit purchase based on production (i.e. cents per kilowatt hour of production) in place of an upfront lump sum payment. Term and credit purchase price for such systems are to be negotiated between the customer and APS before a reservation for the funds is made. If the reserved funding is not fully subscribed by such projects by the end of September each year, the remaining funds will be released for upfront lump sum credit purchase payments.

B. Off-grid Photovoltaic Systems.

This option is available to residential and commercial customers in remote areas who are not connected to the electrical grid and wish to purchase a solar energy system to provide power for their electrical needs. The off-grid option can provide a cost effective alternative for rural customers, who would otherwise incur a line extension cost to receive electrical service. APS will also make this option available to residents in remote

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fringe areas that are adjoining the Company's service territory, with the permission of the adjoining utility. A customer receives a one-time EPS Credit Purchase payment of \$2.00 per watt-DC for the installation of an off-grid remote photovoltaic system, up to a maximum of 5kW. For example, a 1,000-watt solar system qualifies the customer to receive \$2,000 from APS. For system expansions, payment is capped at 50% of the total cost for expansion.

Qualifications for Off-Grid Option:

- This option is available to customers who purchase a new, complete, or expand an existing remote photovoltaic solar system. A complete remote solar electric system includes solar panels, batteries, inverter, and other related equipment to provide AC electricity to a customer site.
- The system must be installed in APS service territory, with limited exceptions in fringe areas.
- The system must use UL components and meet IEEE 929 specifications.
- An Arizona-licensed contractor must install the system.
- This option is limited to a maximum system size of 5 kW.

C. Small Solar Water Heating Systems.

This option is available to both residential and commercial customers to replace an electric water heater or other water heating system approved by the ACC. The customer receives a one-time EPS Credit Purchase payment for the installation of a solar water heating system of \$0.50 per first year kilowatt hour savings based on the OG-300 rating from the Solar Rating Certification Corporation ("SRCC").

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Qualifications for Solar Water Heating System:

- This option is available to both residential and commercial customers and must replace an electric water heater or other water heating system approved by the ACC.
- The system must have obtained certification under the Solar Rating and Certification Corporation's OG-300 system rating test.
- An Arizona-licensed contractor must install the system.
- This option is limited to systems rated at ~~100,000~~ 10,000 kWh per year energy savings or less.

D. Large Solar Water Heating Systems

This option is available to commercial customers to replace an electric water heater or other water heating system approved by the ACC<sup>4</sup>. The customer receives a production-based incentive (PBI) for the thermal energy delivered by a solar water heating system of \$0.07 per kilowatt hour-equivalent based on metered production. The PBI is for a term of 10 years or 50% of the total system cost, whichever comes first. The cost associated with financing the system may be included in the total system cost (receipts or documentation must be provided to APS at the time of the credit purchase agreement execution) and the allowable finance rate is capped at the federal prime rate plus 5%. For example, if a solar system costs \$20,000 and the financing cost is \$2000, then the total system cost (for purposes of this Credit Purchase Program) is \$22,000. Accordingly, the maximum PBI would be \$11,000. Payments are made at the end of each calendar quarter within 30 days of receipt of

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<sup>4</sup> Currently, APS is limited to providing incentives for natural gas customers to two customers per calendar year and a maximum of 60,000 therms per calendar year. If this order is amended or superseded by any other ACC Order, APS' credit purchase program would reflect such a change.

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thermal meter readings. The customer is responsible for providing meter readings. APS reserves the right to inspect the system, including the meter (s), at any time. For purposes of payment, 3,412 BTUs equal one kWh.

Qualifications for Large Solar Water Heating Systems:

- This option is available to commercial customers and must replace an electric water heater or other water heating system approved by the ACC.
- Minimum system size is 5,000 kWh per year energy savings
- Payments are based on delivered BTUs which are defined as BTUs generated and used for heating water excluding waste heat.
- An Arizona-licensed contractor must install the system.

E. Solar HVAC Systems

This option is available to commercial customers to replace an electric HVAC system or other HVAC systems as approved by the ACC. The customer receives a PBI for the thermal energy delivered for cooling by a solar HVAC system of \$0.16 per kilowatt hour-equivalent based on metered production. In addition, systems that incorporate solar thermal heating and/or solar thermal water heating are eligible for the large solar water heating PBI of \$0.07 per kilowatt hour-equivalent of thermal energy delivered for heating. The PBI is for a term of 10 years or 50% of the total system cost, whichever comes first. All heating and cooling payments are credited for calculation of the 50% cap. The cost associated with financing the system may be included in total system cost (receipts or documentation is provided to APS at the time of the credit purchase agreement execution), and the allowable finance rate is capped at the federal prime rate plus 5%. For example, if a solar system costs \$20,000 and the financing cost

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is \$2000, then the total system cost (for purposes of this Credit Purchase Program) is \$22,000. Accordingly, the maximum PBI would be \$11,000. Payments are made at the end of each calendar quarter within 30 days of receipt of thermal meter readings. The customer is responsible for providing meter readings. APS reserves the right to inspect the system, including the meter (s), at any time. For purposes of payment, 3,412 BTUs equal one kWh.

Qualifications for Solar Air Conditioning Systems:

- This option is available to commercial customers and must replace an electric HVAC system, or another HVAC system approved by the ACC, and may be used for new construction if not prohibited by another Commission Decision or waiver restriction.
- Minimum system size is 10 tons of cooling.
- Cooling and heating must be metered and reported separately.
- Payments are based on delivered BTUs which are defined as BTUs generated and used for cooling and/or heating purposes excluding waste heat.
- An Arizona-licensed contractor must install the system.

**Dealers and Manufacturers of Photovoltaic Solar Energy Systems**

Dealers and manufacturers of photovoltaic solar energy systems may apply for the EPS Credit Purchase agreement for their own installations on their own premises. Dealers receive a one-time EPS Credit Purchase payment of \$3 per watt-DC or 50% of the system cost basis, whichever is less. The cost basis for a dealer will be based on their actual cost of the technology. In addition to the general and grid-tied system requirements, dealers and manufacturers must also comply with the following.

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Additional Requirements for Dealers and Manufacturers:

- A dealer cannot profit from installing their own systems on their facilities or include a markup on systems sold to themselves or their employees.
- Dealers cannot include installation in the cost basis for the EPS Credit Purchase Program.
- Dealers must be able to verify the cost they paid for each system component by providing a purchase invoice or receipt for each major component with the reservation and agreement.
- Manufacturers are treated the same as dealers but they cannot include their own technology in the cost basis for the EPS Credit Purchase Program.