

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

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

Rulemaking 12-11-005
(Filed November 8, 2012)

**JOINT IMPLEMENTATION PLAN OF THE CALIFORNIA CENTER FOR
SUSTAINABLE ENERGY, PACIFIC GAS AND ELECTRIC COMPANY (U39E), AND
SOUTHERN CALIFORNIA GAS COMPANY (U904G) TO INCORPORATE SOLAR
HEATING POOL SYSTEMS INTO THE CALIFORNIA SOLAR INITIATIVE
THERMAL PROGRAM**

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May 8, 2013

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I. INTRODUCTION

The California Solar Initiative-Thermal (“CSI-Thermal”) Program Administrators (“PAs”), representing Southern California Gas Company (“SCG”), Pacific Gas & Electric Company (“PG&E”) and the California Center for Sustainable Energy (“CCSE”), would like to thank the California Public Utilities Commission (“CPUC”) for hosting a workshop on April 23, 2013 to address issues related to CSI-Thermal Program eligibility of solar heating pool systems based on the passage of Assembly Bill (“AB”) 2249 (Stats. 2012, ch. 607). The PAs have carefully reviewed and considered proposals and cost considerations in developing this proposal to implement the solar pool heating program. It is evident that representatives at the workshop put considerable thought into their proposals and strove to identify a workable approach. In preparing this proposal, the PAs have sought to incorporate elements from industry proposals and Energy Division feedback that the PAs believe are feasible. The PAs’ proposal is based on solar pool heating industry stakeholder and PA administration experience. The PAs believe this proposal will meet the needs of the majority of the solar water heating community and will promote and encourage the installation of solar water heating systems.

II. BACKGROUND

AB 2249 was signed by the Governor on September 27, 2012 and became law on January 1, 2013. The bill expanded the definition of a solar water heating system to include a facility meeting certain specified requirements and qualified the exclusion of single-family residential solar pool heating systems from the definition of a solar water heating system. The bill also deleted the requirement that the CPUC evaluate data available from a specified pilot program before it makes a specified determination to design and implement a program of incentives for the installation of the equivalent of 200,000 solar water heating systems in homes and business throughout the state by 2017. AB 2249 also revised certain eligibility criteria allowing for the installation of solar water heating systems at government, nonprofit, and educational sites and would require the CPUC to determine an appropriate division of funds between solar water heating systems that are and are not solar pool heating systems.

Specifically, Section 2861 of the Public Utilities Code is amended to read:

“Solar water heating system” means a solar energy device that has the primary purpose of reducing demand for natural gas through water heating, space heating, or other methods of capturing energy from the sun to reduce natural gas consumption in a home, business, or any building or facility receiving natural gas that is subject to the surcharge established pursuant to subdivision (b) of Section 2863, or exempt from the surcharge pursuant to subdivision (c) of Section 2863, and that meets or exceeds the eligibility criteria established pursuant to Section 2864. “Solar water heating systems” include multifamily residential, governmental, educational, and nonprofit solar pool heating systems, but do not include single-family residential solar pool heating systems.

Furthermore, AB 2249 requires that its changes be implemented no later than July 1, 2013. By email dated March 20, 2012, Administrative Law Judge (“ALJ”) Katherine Mac Donald confirmed that the PAs were to hold a workshop to solicit industry feedback in order to provide recommendations to the CPUC for program implementation. Accordingly, on April 23, 2013, the PAs held a public workshop at the CPUC to solicit industry comments. The workshop included representatives from solar manufacturers, contractors, data service providers, and installers. The PAs provided proposed guidelines for the solar pool heating portion of the CSI-

Thermal Program which resulted in a constructive dialogue. Per the ALJ's further instructions, the PAs were required to file this implementation plan by May 8, 2013. Comments on this implementation plan are due May 22, 2013. Reply Comments are due May 31, 2013.

III. THE PAS' PROPOSAL

The following sections are the PAs' proposed recommendations for the implementation of the solar pool heating component of the CSI-Thermal Program, based on the workshop discussions and industry feedback. The proposal includes sections on Incentives/Budget, Sizing Requirements, Calculator/Model, Eligibility Requirements, Metering Requirements, and Combination Systems.

A. INCENTIVES

1. INCENTIVE BUDGET

The PAs propose two separate incentive structure options for the implementation of eligibility of solar pool heating systems into the current CSI-Thermal Program. The PAs hope that the comments on this proposal will assist in determining the best overall option for the program. Both options start with the same incentive amount of \$7.00 per estimated annual therm displaced.

Option 1:

The PAs propose Option 1, which would incorporate solar pool heating system incentives into the existing multifamily/commercial incentive structure. This shared budget would pay incentives, whether multifamily, commercial, or solar pool heating systems, on a first-come first-served basis, regardless of thermal technology. This Option will allow the program to achieve, and perhaps surpass, the outlined CSI-Thermal Program goals. While the solar pool heating systems would share an incentive budget with the existing multifamily and commercial program, solar pool heating systems would be given a separate incentive rate.

All PAs have the potential to be in Step 2 of the multifamily/commercial incentive structure by the time the solar pool heating systems program is launched. Because of this potential, the PAs recommend using the same solar pool heating system incentive rate of \$7.00

per estimated annual therm displaced for both Step 1 and Step 2, in order to create a more fair and technology neutral integration into the current thermal program incentive structure. Steps 3 and 4 would have a declining incentive structure as shown below in Table 1. The \$7.00 per estimated annual therm displaced is in line with the current multifamily/commercial incentive savings, and takes into account that solar pool heating systems do not qualify for investment tax credit benefits.

The annual therms displaced in Table 1 are based on the assumption that in Step 1, there will be 25% pool applications and 75% multifamily and commercial applications. Steps 2-4 assume a 50% split in applications between pool and multifamily and commercial applications.

**Table 1
Solar Pool Heating System Incentive Steps
(Option 1 Proposed Incentive Structure)**

Step	Incentive per Annual Therm Displaced for Multifamily/Commercial	Incentive per Annual Therm Displaced for Solar Pools	Maximum Incentive for Commercial/Multifamily SWH projects	Budget Allocation (in millions)	Annual Therms Displaced Multifamily/Commercial (1000)	Annual Therms Displaced Solar Pools (1000)	Annual Therms Displaced Total (1000)
1	\$14.53	\$7.00	\$500,000	\$34	1755	1,214	2,969
2	\$9.88	\$7.00	\$500,000	\$26	1,316	1,857	3,173
3	\$6.55	\$5.00	\$500,000	\$23	1,756	2,300	4,056
4	\$3.13	\$3.00	\$500,000	\$16	2,556	2,667	5,223

**Table 2
Multifamily and Commercial Natural Gas-Displacing System Incentive Steps
(Current Incentive Structure)**

Step	Incentive per Annual Therm Displaced	Maximum Incentive for Commercial/Multifamily SWH projects	Budget Allocation (in millions)	Annual Therms Displaced (1000)
1	\$14.53	\$500,000	\$34	2,340
2	\$9.88	\$500,000	\$26	2,632
3	\$6.55	\$500,000	\$23	3,510
4	\$3.13	\$500,000	\$16	5,106

The Option 1 solar pool heating system incentive structure is consistent with the energy savings goal set for the CSI-Thermal Program in CPUC Decision (“D.”) 10-01-022 to achieve the installation of natural gas-displacing systems that displace 585 million therms (equivalent to 200,000 single-family residential systems) over the 25-year life of the systems. Table 2 shows 13,588,000 in projected annual therms saved under the existing multifamily/commercial incentive structure. Assuming the solar pool heating system adoption rate noted previously, the annual therms saved after adding solar pool heating systems to the existing incentive structure is projected to be 15,421,000. The higher projected therms savings are based on the assumption that the therms saved would be achieved at a lower incentive rate within a given Step. The solar pool heating system incentive goals will also achieve an expansion of the market for other solar thermal technologies that displace natural gas and have a positive impact on Greenhouse Gas (“GHG”) reductions.

Option 2:

The PAs recognize that incorporating multiple end-uses and technologies into the existing multifamily/commercial program, using the same incentive budget, while still achieving the program goals, may create challenges. Market transformation may not occur evenly among the various thermal technologies if incentives primarily support solar pool heating systems, especially if these systems dictate the incentive declines. Another challenge is providing transparency of available funding for a given step when there are multiple programs with different incentive amounts utilizing the same budget.

For the reasons outlined above, the PAs present Option 2, which intends to fund solar pool heating systems separately from the remaining multifamily/commercial incentives using existing Step 3 and Step 4 funds. Separating the solar pool heating system incentive funds from the CSI-Thermal general market program would prevent solar pool heating systems from triggering drops in incentive steps for all multifamily/commercial systems, or vice versa. Both general market and solar pool heating system programs will have more transparency regarding available incentive budgets and step levels for their respective programs.

Per Table 2 above, Step 3 and Step 4 funds total \$39 million in incentives and equate to a projected annual therm savings of 8,616,000 therms. The PAs propose a 3-Step declining incentive structure for the solar pool heating system program from these funds as shown in Table 4 below. Step 1 and 2 for multifamily/commercial incentives will not be affected as shown in Table 3, below. The single-family incentive rates will also not be affected. Incentive budgets for each PA are allocated using the same percentages established for the current CSI-Thermal Program.

In Option 2, the PAs diminish the impact on the existing incentive Step levels 1 and 2 for the multifamily/commercial incentives due to the possibility that there could be a drop from Step 1 to Step 2 for multifamily/commercial applications prior to launching the solar pool heating system program. The implementation of the solar pool heating system program necessitates several CPUC filings along with modification of the CSI-Thermal Program Handbook and expansion of the database to accept solar pool heating system applications. While this process is occurring, there is a possibility that a drop will occur in the incentive step levels for the multifamily/commercial applications.

Furthermore, the solar pool heating system incentive structure is consistent with the CSI-Thermal Program energy savings goals. Of this total, the annual therms anticipated to be saved from the multifamily/commercial Step 3 and Step 4 are 8,616,000 and the annual therms saved from solar pool heating systems are 8,619,000. The revised solar pool heating system incentive structure proposed here will also support the goals of expanding the market for other solar thermal technologies that displace natural gas and have an impact on GHG reductions.

For Option 2, the PAs propose that incentives start at \$7.00 per estimated annual therm displaced and decrease in three steps based on the budget allocations shown in Table 3. The \$7.00 per estimated annual therm displaced incentive is in line with the current multifamily/commercial incentive savings taking into account that solar pool heating systems do not qualify for investment tax credit benefits.

Step changes in Option 2 will move independently by PA territory and will not be impacted by the general market CSI-Thermal Program incentive decreases.

Table 3
Multifamily and Commercial Natural Gas-Displacing System Incentive Steps
(Option 2 Proposed Incentive Structure)

Step	Incentive per Annual Therm Displaced	Maximum Incentive for Commercial/Multifamily SWH projects	Budget Allocation (in millions)	Annual Therms Displaced (1000)
1	\$14.53	\$500,000	\$34	2,340
2	\$9.88	\$500,000	\$26	2632

Table 4
Solar Pool Heating System Incentive Steps
(Option 2 Proposed Incentive Structure)

Step	Incentive per Annual Therm Displaced	Maximum Incentive for Commercial/Multifamily SWH projects	Budget Allocation (in millions)	Annual Therms Displaced (1000)
1	\$7.00	\$500,000	\$16	2,286
2	\$5.00	\$500,000	\$10	2,000
3	\$3.00	\$500,000	\$13	4,333

B. PA'S RECOMMENDATION

The existing CSI-Thermal Program has been active since 2010. While solar pool heating system applications will incur a late start to the incentive program, the PAs feel that both Options 1 and 2 should have a positive impact on the marketplace and meet the overall objectives of the CSI-Thermal Program. Option 1 would take less administrative dollars to implement and would allow the market to determine its own adoption rate. Also, by keeping the incentive budget shared, there is less concern about shifting funds to cover exhausted incentive classes at a future time. Therefore, given the streamlined implementation into the current incentive program, efficiency of administrative funds, and greater therm offset, the PAs recommend Option 1 as the

preferred method of implementation of CSI-Thermal Program eligibility for solar pool heating systems.

Because it is extremely difficult to predict how the solar thermal market will progress, the PAs request that regardless of the chosen Option, the proposed breakdowns of incentive funds be reexamined and redistributed in the future if it is determined that it is necessary to meet the program goals.

C. SIZING REQUIREMENTS

The PAs recommend no sizing cap for solar pool heating systems based on guidelines from existing competitive market conditions. System sizing can vary widely based on climate zone, collector array orientation, shading and wind conditions. Based on discussions with the solar pool heating system industry, there are existing codes, standards and health regulations that must be met, and this places sufficient sizing and installation restrictions on solar pool heating systems. Furthermore, swimming pools operate at much lower temperatures than domestic hot water loads. Oversizing a solar pool heating system will typically result in a smaller temperature rise across the solar collectors to a point where no useful energy is collected. The PAs feel this will greatly constrain the oversizing of solar pool heating systems. Although most solar pool heating systems use unglazed collectors, the PAs recommend that the sizing should not be limited to unglazed collector performance, but should be technology neutral. The PAs hope this will drive technology innovation for solar pool heating systems and create a cost-competitive environment.

D. CALCULATOR / MODEL

The PAs recommend that payments be made based on an expected annual therms displaced basis using a modified version of the existing online calculator. The PAs propose that TRNSYS swimming pool Type 344 indoor and outdoor pool model be incorporated into the existing calculator for use by solar pool heating systems. The calculator will be embedded in the

multifamily/ commercial application database.¹ Based on historic data gathered for developing load profiles for heating swimming pools, the recommended model is sufficient for calculating incentives based on energy saved. Therefore, a Performance Based Incentive (“PBI”), structure is not required. The solar pool heating system calculator will include inputs similar to the existing commercial calculator. Additional parameters and assumptions will be incorporated that apply specifically to solar pool heating systems. The PAs, in collaboration with the solar thermal industry, will determine the additional calculator inputs and assumptions at a later date, after sensitivity analyses have been conducted. The solar hot water calculator output will produce the estimated annual energy savings in units of therms and the estimated incentive amount at the current incentive step level.

The PAs also recommend that the calculator include an assumption that all pools have a cover. The PAs acknowledge that some pools cannot install pool covers due to safety and code restrictions. Therefore, pool covers should not be mandated for solar pool heating systems, but rather, strongly encouraged where permitted. As noted in the current CSI-Thermal Program, making a home or business energy efficient before going solar is an essential first step. Although not a requirement of the CSI-Thermal Program, the solar pool heating system model will assume a pool cover based on 12 hours per day of coverage.

The PAs recommend that the calculator assume a pool temperature of 80°F. Some applications do require higher pool temperatures, and therefore, customers should be allowed to design and operate pools at higher temperatures. However, based on best industry practices, pool temperatures are commonly set at 80°F.

As noted above, additional calculator inputs and assumptions will be determined through further analyses.

¹ www.csithermal.com.

E. ELIGIBILITY REQUIREMENTS

1. Customer Eligibility

Eligibility of solar pool heating systems applies to gas customers only. Solar water heating systems include multifamily residential, commercial, governmental, educational, and nonprofit solar pool heating systems, but do not include single-family residential solar pool heating systems. To be eligible for a solar pool heating incentive, the Host Customer must be a natural gas customer of PG&E, SCG, or San Diego Gas & Electric Company (“SDG&E”)². The customer must install the solar pool heating system on a new or existing facility.

2. Effective Date/Permit Requirements

The PAs recommend that necessary local permits be required for solar pool heating system installations. A final signed-off permit issued by the appropriate permitting agency is a key requirement in determining project completion. In order to be eligible for a solar pool heating system incentive, the PAs recommend that permits for solar pool heating systems must have final permits signed-off on or after January 1, 2013. Any system that received a final permit sign off prior to January 1, 2013, would be ineligible for participation in the CSI-Thermal Program.

F. METERING REQUIREMENTS

Accurate measurement of system performance is necessary to ensure cost-effectiveness for System Owners and ratepayers. As required by AB 1470, the existing CSI-Thermal Program requires systems with a capacity over 30 kWth (equivalent to 462 square feet of fluid collectors) to have Customer Performance Monitoring (“CPM”), to ensure that System Owners can effectively monitor the system’s performance. The cost for equipment will be borne by the System Owner.

As noted previously, the solar pool heating system model calculator will be embedded in the multifamily/ commercial application processing database. Based on data gathered for

² CCSE administers the CSI-Thermal Program in SDG&E service territory.

