R.06-03-004

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

San Diego Regional Energy Office Submittal of the Solar Water Heating Pilot Proposal for the California Solar Initiative, Pursuant to D.06-01-024

San Diego Regional Energy Office

May 26, 2006

Irene M. Stillings
San Diego Regional Energy Office
8520 Tech Way, Suite 110
San Diego, CA 92123
Tel: (858) 244-1192
Fax: (858) 244-1178
Irene.stillings@sdenergy.org

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

SDREO Submittal of the Solar Water Heating Pilot Proposal for the California Solar Initiative, Pursuant to D.06-01-024

The San Diego Regional Energy Office (SDREO) hereby submits our proposed Solar Water Heating Pilot Program for the SDG&E service territory. The January 12, 2006 Decision 06-01-024: *Interim Order Adopting Policies and Funding for the California Solar Initiative*, directed SDREO to file with the Commission a proposed program implementation plan for an 18-month Solar Water Heating (SWH) Program within the SDG&E Service Territory, set to begin January 1, 2007. Please note that Decision 06-01-024 stated that SDREO was to file this proposal with the R.04-03-017 proceeding, which is now closed. Therefore, SDREO files this proposal with R.06-03-004 which is the continuation of that earlier rulemaking on distributed generation. The proposal is attached.

Irene M. Stillings
Executive Director
San Diego Regional Energy Office
8520 Tech Way, Suite 110
San Diego, CA 92123
Tel: (858) 244-1192

SWH Proposal

San Diego REGIONAL ENERGY OFFICE

California Solar Initiative

Solar Water Heating

Pilot Program

Proposal Prepared for

California Public Utilities Commission

Prepared by

San Diego Regional Energy Office

May 24, 2006

About the San Diego Regional Energy Office

The San Diego Regional Energy Office (SDREO) is an independent, nonprofit 501(c)(3) corporation that helps residents, businesses and public agencies save energy, reduce grid demand and generate their own power through a variety of rebate, technical assistance and education programs. SDREO also provides the community with objective information, research, analysis and long-term planning on energy issues and technologies. For more information, visit our website at http://www.sdenergy.org or call us toll free at 1-866-SDENERGY. ***We are working for a sustainable energy future.***

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1 Program Overview

1.1 Program Concept

The Solar Water Heating (SWH) Pilot Program will provide rebates to residential and non-residential customers who install qualifying solar water heating systems that offset energy used by an existing natural gas or electric water heater or boiler. It will also provide necessary education and training. For new construction projects, San Diego Regional Energy Office (SDREO) will coordinate efforts with the California Energy Commission (CEC).

The 18 month pilot will be available to residential, commercial and industrial customers of the San Diego Gas and Electric (SDG&E) service territory.

1.1.1 Innovation

The SWH Pilot Program is innovative in basic design by virtue of type of technology – SWH is an energy efficiency measure with a renewable component. It will be the first ratepayer funded program that tangibly connects renewable technology to energy efficiency. Additionally, solar water heating is a measure that speaks to the concept of sustainability and specifically climate change

1.2 Background

On January 12, 2006, the California Public Utilities Commission (CPUC) issued Decision D.06-01-024 creating the California Solar Initiative (CSI). As part of the CSI, SDREO was directed to develop a SWH Pilot Program. The SWH Pilot Program is designed to encourage the adoption of SWH technologies by providing financial incentives to assist with installation costs, training for installers and education to help potential customers make informed decision.

The CSI Decision called for an 18-month SWH Pilot Program within the SDG&E service territory. The Decision further stated that the pilot would be assessed after 12 months to determine its need and whether it should be expanded statewide. In the development of this pilot proposal, SDREO conducted a public workshop in March 2006 on solar water heating to solicit stakeholder input and comments. SDREO incorporated public comments, and conducted its own engineering, administration and marketing evaluations. A draft proposal was circulated to workshop participants and interested parties for review and comment in early May.

1.3 Program Rationale

According to a 2003 PG&E study,[1] solar water heating systems represent the largest untapped therm savings potential remaining in California with a savings potential of over 800 million therms, compared to the next largest savings opportunity of 300 million therms for horizontal clothes washers. In addition to financial savings and energy savings, SWH systems can help protect against future gas and electricity shortages and reduce our dependence on foreign sources of energy. SWH systems also help preserve the environment by avoiding pollutants such as carbon dioxide, nitrogen oxide and sulfur dioxide.

SWH systems installed in place of existing electric water heating systems can also help reduce grid demand, thus reducing the need for new power plants. Unfortunately, the technology has lacked visibility in energy portfolios because it has not been defined as either an “energy efficiency” product or a “self-generation” product.

1.3.1 Current Market Penetration Barriers

SDREO has identified the following reasons for this lack of market penetration.

- **High initial costs**

  While SWH systems can be cost-effective over their total life cycle, many consumers lack the up-front capital needed or simply cannot afford the lengthy payback periods. Customers have a “first cost” bias which favors purchasing the least expensive equipment without factoring in total life cycle costs. According to the above referenced PG&E study, less than 1% of consumers purchase SWH systems.

- **Lack of information; cost of search**

  Consumers lack knowledge about the financial and social benefits of solar water heaters and need a “one stop shop” for reliable up-to-date information. Currently, potential SWH customers have to solicit information from many sources including libraries, websites, local utilities, contractors, etc. There is a high cost in time and effort to identify proven equipment and locate experienced contractors.

  Information obtained from contractors and manufacturer sources is not unbiased. Customers want a trusted source of information in order make informed decisions.

[1] P.E-9&10, Coito, Fred and Mike Rufo, California Statewide Residential Sector Energy Efficiency Potential Study, April 2003. and California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Study ID#SW061, prepared for PG&E, Fred Coito and Mike Rufo KEMA-XENERGY Inc. Oakland, CA, July 2003.

- **Negative Public Perception**

  Solar water heating has a checkered history in California. Many residents still remember the often low quality and poorly designed systems installed in the 1980s that leaked causing water damage and in some cases, roof failures. The SWH Pilot Program must overcome these strong negative perceptions as well as provide customers with a strong economic case for participation.

1.3.2 Program Strategies to Address Market Barriers

The following primary strategies will be used to overcome the market barriers identified above:

- **Financial incentives**

  The SWH Pilot Program will provide financial incentives to help customers offset the high initial cost of a solar water heating system.

- **Information and education**

  The SWH Pilot Program will reduce the information and search costs for customers interested in purchasing and installing SWH systems by:

  - Maintaining a website that provides up to date information on solar water heating technology and applications
  - Maintaining and providing public lists of licensed installers who are trained to fulfill rebate requests
  - Providing information on cost effectiveness, reliability and safety of SWH systems.

- **Awareness**

  As this is a new program area, the SWH Pilot Program will include extensive education, outreach and marketing activities to increase customer awareness of the features and benefits of solar water heaters. This is further addressed in Section 3 – Education, Outreach and Marketing.

1.4 Program Objectives

1.4.1 Short-term objectives

- Identify local interest in SWH technology
- Qualify installers for program participation
- Compile a vendor list for SWH technology and installers in San Diego
- Establish information pages on the SDREO website that help customers choose the right system based on needs and cost effectiveness
- Achieve 750 installations in the SDG&E service territory
- Evaluate the usefulness of a SWH incentive program
- Evaluate the levels of incentive required to develop a sustainable SWH market in California

- Use knowledge gained from SWH Pilot Program administration and metering data to produce a program model that can be applied statewide

1.4.2 Long-term plans and objectives:

- Create a self-sustaining SWH market in California
- Reduce incentive levels over 10 years (if pilot extended to full CSI program)
- Assist in "ramping up" vendor production and installer trainings necessary to satisfy future demand. It is anticipated that as natural gas prices increase, the SWH market will become more sustainable.
- Reduce dependence on foreign oil and gas.

1.4.3 Other Objectives

- **Conduct Targeted Outreach and Education to Low-Income and Affordable Housing Sectors**
  SDREO has already met with SDG&E to discuss ways to coordinate SWH Pilot Program outreach efforts with the IOU's Affordable Housing and Low Income programs.

The SWH Pilot Program is innovative in nature, bridging the gap between energy efficiency and renewable energy programs. As such, SDREO also plans to include the benefits that will be achieved by this program in energy efficiency terms. Listed below are the objectives from the CPUC Energy Efficiency Policy Manual that the SWH Pilot Program positively addresses:

- **Energy Savings**
  The SWH Pilot Program is consistent with the CPUC directive of funding programs to produce hard energy savings. This SWH Pilot Program will set the precedent for California by identifying the actual energy savings goals related to solar water heating.

- **Governor's and State's goals of greenhouse gas emissions reduction**
  This program pursues the Governor's and State's goal of greenhouse gas emissions reduction by lowering the usage of natural gas and electricity with the installation of a solar system to provide power for water heating. Systems will be required by local regulations to keep a back up hot water system, but there are greenhouse gas emissions reductions associated with the percentage of time the storage hot water heater (gas or electric) is not in use. These reductions will be noted throughout the implementation of the program.

- **Minimizing lost opportunities**

  Customers will receive an energy efficiency information packet that includes energy saving ideas and practices, as well as information on technical assistance and incentive programs to help them implement the opportunities.

  Commercial customers will be offered an energy-saving audit via existing energy efficiency and/or demand response programs. The outreach and marketing campaign aimed at attracting customers will also help make them aware of energy efficiency opportunities.

  The SDREO website, which customers may need to visit in order to download the appropriate forms and information, also contains energy efficiency ideas for the home and office.

2 Program Implementation

2.1 Program Timeline

Pending CPUC approval, SDREO will develop a SWH Pilot Program handbook, program materials, and create a SWH Pilot Program website.

The SWH Pilot Program will accept project applications over the course of 18 months beginning on January 1, 2007 or within 30 days of CPUC program approval if after 12/2/06. Application submittals will be required prior to installing a SWH system. Incentive funding can be reserved for a period of 6 months. All systems must be installed and all final claim documentation submitted by December 31, 2008.

2.2 Program Reports

SDREO will follow the reporting process set forth by the CPUC.

At the end of the initial 12 month program period, SDREO will evaluate the impacts of the SWH Pilot Program on equipment prices, demand and overall cost-effectiveness. Topics will include how the program is affecting the industry, whether or not the program is installing quality systems and effects on the program on system costs. The final report will give recommendations for future program implementation.

2.3 Customer Eligibility

Program participation will be limited to residential, commercial and industrial customers of SDG&E. Applicants will be required to show proof of electric and/or gas distribution services provided by the utility.

2.4 Eligible Technologies

Residential, commercial and industrial SWH systems that offset energy used by an existing natural gas or electric water heater or boiler are eligible.

Large pools owned or operated by public entities will be allowed to participate in the program. It is not clear if these large scale solar pool heating systems are cost effective without incentives. Furthermore, public entities often lack the up front capital and/or budget dollars to move forward with projects of this nature. As part of the requested market impacts report, SDREO will determine how solar pool heaters should be included in future programs.

Ineligible Technologies for the Pilot

Residential solar pool heating systems are excluded from the SWH Pilot Program. According to industry sources they are already a cost-effective option for home owners without incentives.

Additional solar thermal technologies such as solar heating, ventilation and air conditioning equipment, etc.are excluded per D.04-03-017. SDREO is open to expanding the pilot to include these technologies at a later date, if so directed by the CPUC.

2.5 Incentives

Customers will be provided with two incentive options (Prescriptive Method or Area Method) to make participation easy while ensuring installed systems perform correctly. Additional details on each method are provided in Appendix A.

2.5.1 Prescriptive Method

The Prescriptive Method will be used for residential or small commercial SWH incentives and is based on an estimated system performance. Estimated system performance will be calculated using the Solar Rating Certification Corporation (SRCC) OG300 system ratings, solar orientation factors, and other inputs. In order to participate in the prescriptive method, a system must have a minimum system rating of 1,200 kWh if the solar water heating system is offsetting an electric water heater or 60 therms if the solar water heating system is offsetting an natural gas water heater. The incentive would be paid upon final

inspection of the system. 100 Prescriptive Method systems will be metered as part of the SWH Pilot Program.

2.5.2 Area Method

The Area Method will be used for larger, innovative or nonresidential pool heating systems. Incentives will be calculated on a "per square foot of collector" basis incorporating factors for system type and solar orientation. Collectors must have an SRCC OG100 rating. SWH projects installed on large pools may elect use FSEC rated collectors. 100% of projects using the Area method will be metered and one month of successful meter data will be required to demonstrate the system is working properly. Incentives will be paid after final inspection and verification of system performance. Incentive shall be capped at $75,000 for building water heating systems and $30,000 for nonresidential pool systems.

2.5.3 Incentive Budget

The SWH Pilot Program proposes an overall incentive budget of $1,200,000, of which $900,000 will be allocated for prescriptive systems and $300,000 for area method systems. SDREO has distributed the funding in this manner in order to address concerns that large commercial systems could potentially use all of the incentive money. SDREO will offer incentives on a first-come, first-serve basis within each category. Pending program activity, SDREO reserves the right to shift funds if either incentive method doesn't perform as anticipated.

2.5.4 Incentive payment

Prior to receiving incentive payment, all systems must pass final inspection and receive final approval of incentive claim documentation. Area Method systems must also demonstrate 30 days of system performance via metering. Upon meeting final program requirements and metering requirements, if applicable, SDREO will issue incentive payments within 30 days.

2.6 Quality Assurance

Malfunctioning systems were a problem during the last SWH program of the early 1980s. Several methods will be used to ensure systems installed through this SWH Pilot Program function properly for their expected lifetime.

2.6.1 Inspections

SDREO will inspect 100% of the systems installed through the SWH Pilot Program in accordance with an inspection checklist to be finalized upon program approval. A draft checklist, modeled after those used by other SWH incentive programs, is provided in Appendix C. The inspection checklist is a quality assurance measure designed to guarantee that systems are installed and functioning properly prior to incentive payment.

2.6.2 Incentives paid to Installer Only

Incentives disbursed via the SWH Pilot Program will only be paid to installers/contractors. The purpose of this is to ensure systems are functioning properly before incentives are paid. Since the installer is directly responsible for system quality and performance, withholding the incentive until the system is performing as designed serves as motivation for the installer to do the job correctly.

If incentives were paid directly to the homeowner, they would assume responsibility for quality assurance for a system for which they already paid their installer. SDREO cautions that should the system fail inspection, an installer may not be readily accessible to fix the system within an appropriate timeframe. In this rare event, the homeowner could risk forfeiting the incentive.

If a homeowner demonstrates an adequate reason as to why the incentive should be paid directly to them and wishes to assume this responsibility, a payment reassignment form must be filed with SDREO.

2.6.3 License and Permit Requirements

All systems must be installed by appropriately licensed California contractors in accordance with the rules and regulations adopted by the State of California Contractor's State Licensing Board. Systems may also be self-installed by the purchaser (system owner).

In order to demonstrate compliance with local and state building codes, all system will be required to submit a copy of the final building permits.

2.6.4 Installer/Contractor Training

In order to participate in the SWH Pilot Program, installers will be required to attend a 1-day training workshop. Only installers who participate in the workshop will be allowed to collect incentives from the program. Owners who elect to self-install will be required to attend the training. SDREO will post a list of eligible installers on the SWH Pilot Program website.

The training workshop will provide an overview of the SWH Pilot Program handbook, forms, requirements and resources. An overview of the required inspection checklist and program metering requirements will also be provided to the installers.

2.6.5 Metering

All Area Method systems will be metered for up to one year and 100 Prescriptive Method systems will also be metered during the SWH Pilot Program. The first 3 systems installed by a given contractor will be metered. Metered systems will be selected at SDREO's discretion thereafter.

Eligible metering equipment will be determined by SDREO and metering costs for required equipment will be covered by the SWH Pilot Program. SDREO will post a list of eligible metering equipment to the SWH Pilot Program website and coordinate the installation with the contractors. Metered data will be used to evaluate system performance, incentive structures and energy savings. This will further aid in a determination of extending and/or expanding the SWH Pilot Program.

2.6.6 Owner's Manual

SDREO will verify that the contractor/installers have provided a detailed operation and maintenance manual to the customer at the time of the final inspection. The owner's manual should contain detail on system design and operation, including a maintenance schedule and a sequence of operations for system shutdown.

2.7 Potential Program Synergies

- SDREO will investigate offering on-bill financing with SDG&E.
- SDREO will investigate partnering with SDG&E's Affordable Housing and Low Income programs.
- SDREO will look into the applicability of using low interest CEC loans for financing larger commercial systems and incorporate those findings in the education and outreach efforts of the program.
- SDREO will investigate partnering with local building departments to streamline the permitting process for SWH systems. Local installers have indicated permitting can be a major road block to a timely installation.
- SDREO will investigate the potential for partnerships with manufacturers and/or installers to achieve a discounted purchase price for the SWH Pilot Program customers. This potential partnership would be established through fair and equitable business practices as appropriate; furthermore, this concept will be pursued for both the commercial and residential market segments, but applied only if a positive result can be reasonably achieved.
- SDREO will investigate the use of Renewable Energy Credits (RECs) in residential applications. RECs have the potential to make SWH systems more cost effective.

3 Education, Outreach and Marketing

The SWH Pilot Program will be promoted to potential customers through a combination of education, community outreach and marketing. Due to the fact that this is a completely new program with untested

communications channels and messages, strategies and tactics must remain flexible to allow for mid-course corrections and modifications.

SDREO will actively monitor results from these activities to determine what works best. These "lessons learned" can then be applied to any future SWH programs to improve efficiency. If one particular channel proves much more successful than others, it may be possible to improve cost effectiveness mid-program by reducing or eliminating activities in other channels.

Education and marketing costs for the SWH Pilot Program will be higher because materials, designs, curricula, concepts and productions are being developed from scratch for a relatively small potential customer base. Spreading these relatively fixed costs over a larger customer base (e.g. for future statewide implementation) would greatly improve program efficiency and/or cost-effectiveness. Education, outreach and marketing activities are also front-loaded into the initial program launch and startup (first 6 months).

3.1 Objectives

- Explain the features and benefits of solar water heating to consumers.
- Educate contractors, installers and other implementers about the SWH Pilot Program.
- Overcome negative public perceptions about SWH systems that persist from the early 1980's.
- Support manufacturer, contractor and installer marketing efforts.
- Generate qualified leads and produce actual installations.

3.2 Target Customers

- Homeowners (matched to appropriate income levels and suitability of building for SWH)
- Condominium associations
- Apartment building owners
- Commercial and public facilities and facilities managers
- SWH contractors and installers
- SWH manufacturers

3.3 Education Tactics

- Develop educational materials and curricula to support target markets.
- Conduct technical seminars, workshops and trainings for contractors and installers
- Conduct non-technical seminars for potential customers.

- Provide technical and program information on SDREO website
- The SWH technologies will be featured extensively during SDREO's "Solar Energy Week" events in 2006 and 2007.
- Highlight homes with SWH on 7th and 8th Annual Solar Homes Tour
- Workshops and trainings at SDREO Solar Energy Weeks
- Feature a large-scale installation during Commercial Solar Tour.

3.4 Outreach Tactics

- Promotion at ERC related workshops and technical sessions
- Email blasts to SDREO's internal mailing lists
- Coverage in SDREO's monthly news letter Energy Connection
- Attendance at local and regional events in San Diego County including Earth Fair, environmental events, home improvement shows and the San Diego County Fair.
- Press conference and media event for initial program launch.
- Media releases and story pitches to target publications
- White papers and case studies.

3.5 Marketing Tactics

- Develop and produce program brochures or other collateral for potential customers, contractors, and program participants.
- Place print advertisements in local newspapers, home and garden magazines and trade publications.
- Provide special contractor support including materials, identify kits, case studies, etc.
- Web advertising on targeted local sites
- Develop commercial and PSA-type radio and television spots. Place on targeted local media.
- Cooperative marketing with other organizations including:
    - Home improvement stores
    - Offer to conduct education events
    - Equipment manufacturers and installers
    - Industry trade groups
    - Local environmental groups
    - SDG&E
    - Local governments and public agencies

3.6 Other Tactics

The following activities will be closely integrated with education, outreach and marketing activities.

- All necessary forms will be available on the SDREO SWH Pilot Program website and hardcopies will be available at the SDREO office.
- To improve program efficiency and customer access, an online application system and database may be developed and implemented.

4 Budget

The following table details the 2007-2008 SWH Pilot Program Budget.

Program: SWH Pilot				
		2007		**2008**
Administrative				
Labor	$	155,768	$	186,929
Travel/Other Direct Costs	$	20,500	$	11,500
Direct Implementation				
Final Incentives	$	360,000	$	840,000
Labor	$	247,155	$	259,512
Online Tools/Other Direct Costs	$	121,700	$	66,000
Metering	$	45,000	$	45,000
Education/Outreach				
Labor	$	164,565	$	31,552
Materials/Other Direct Costs	$	107,440	$	23,860
Total Program Budget	**$**	**1,222,128**	**$**	**1,464,354**
Overall Program Budget			**$**	**2,686,481**

5 SWH Pilot Program Recommendations to CPUC

SDREO asks the CPUC to consider the following recommendations during its review of the SWH Pilot Program proposal.

1. **To ensure a timely program launch**, SDREO recommends that the Commission request SDG&E submit to the Energy Division a contract with SDREO for SWH Pilot Program administrative services within 30 days of the CPUC's effective program approval date. SDREO requests that the administrative services contract allow for up-front payments based on quarterly

forecasts similar to the currently executed Self-Generation Incentive Program Administration Contract.

2. **Expand SWH Pilot Program statewide**: Several industry representatives have expressed concern that only implementing the SWH Pilot Program in the SDG&E territory will lead to decreased solar water heating system installations in the other service territories. Potential SWH customers in other service territories may hold off on installing these systems in hopes that the incentive program will be expanded statewide in 2008.

   SDREO believes there is merit to this concern and therefore asks that the Commission consider a statewide SWH Pilot Program. The current program savings goals, budgets and implementation plan would need to be revised to reflect the needs of a statewide program. A statewide pilot could be administered by SDREO or similar to the current SGIP Program Administration method.

3. **Solar thermal heating and cooling systems should be included in any long term solar program**. All solar thermal applications such as space heating/cooling, process heating/cooling, etc, require solar water heating. Industry representatives have indicated that commercial systems are engineered so that solar water heating systems are integrated into larger heating/cooling or process heating/cooling applications. Industry has expressed concern that by excluding solar thermal projects, an opportunity to offset significant natural gas demands may not be realized. Since SDREO was not directed to include them in the SWH Pilot Program, a mechanism for deploying incentives to encourage the installation of solar heating and cooling systems was not addressed herein.

6 APPENDIX A

Incentives for Prescriptive Method

How to calculate an incentive amount for a prescriptive OG300 system:

Electricity Offset – used if existing hot water system uses electricity

Incentive ($) = $1,500 x SOF x SRCC kWh Savings Rating

Natural Gas Offset - used if existing hot water system uses natural gas

Incentive ($) = $1,500 x SOF x SRCC Therms Savings Rating

Inputs:

(SOF) – Solar Orientation Factor, assumed to be 1.0 if system is orientated within ±20° of south and within ±20° of 30° tilt. If either dimension is not within the designated parameters, an SOF of less than 1.0 will be applied according to the table in Appendix B. If multiple panels are oriented at different angles, they can be incentivized at different rates.

(SRCC kWh Savings Rating) = (SRCC kWh savings) / (3200 kWh)

Max Value = 1.0

(SRCC therms Savings Rating) = (SRCC therms savings) / (160 therms)

Max Value = 1.0

Collectors must be SRCC OG300 rated.

SRCC savings ratings for various climate zones are found on the SRCC website[2].

Climate zone determined by zip code table provided by the California Energy Commission.[3]

Minimum SRCC system ratings to qualify for program:

Gas Offset (60 therms)

Electric Offset (1200 kWh)

Max incentive - $1,500

[2] http://www.solar-rating.org/ratings/annuals/annuals.htm

[3] http://energy.ca.gov/maps/climate_zone_map.html

Incentives for "Area" Method

How to calculate an incentive via the "Area" method:

Open Loop Systems –

Incentive ($) = $15 x (Collector area) x (SOF) x (SRCC Collector Performance)

Closed Loop systems -

Incentive ($) = $20 x (Collector area) x (SOF) x (SRCC Collector Performance)

Solar Heaters for Public Entity Pools –

Incentive ($) = $5 x (Collector area) x (SOF) x (SRCC or FSEC Collector Performance)

Inputs:

(Collector Area) – Actual total area of panels to be installed.

(SOF) – Solar Orientation Factor, assumed to be 1.0 if system is orientated within ±20° of south and within ±20° of 30° tilt. If either dimension is not within the designated parameters, an SOF of less than 1.0 will be applied according the tabulated chart in Appendix B. If multiple panels are oriented at different angles, they can be incentivized at different rates.

(SRCC Collector Performance) = (Clear day performance in kBTU from SRCC OG100 ratings) / (1,000 x Gross Area according to SRCC rating)

(SRCC or FSEC Collector Performance) = (Clear day performance in kBTU from SRCC OG100 ratings or FSEC) / (1,000 x Gross Area according to SRCC rating)

Collectors must be SRCC OG100 rated. FSEC ratings are acceptable for eligible pool installations if SRCC ratings are unavailable. Collector performance ratings are found on the SRCC[4] or FSEC[5] websites.

Installed equipment must meet freeze protection requirements set forth by SRCC. Additional freeze protection requirements may be implemented at SDREO's discretion due to San Diego's complex climate zones.

[4] http://www.solar-rating.org/ratings/annuals/annuals.htm

[5] Most solar pool heating collectors are not rated by SRCC, they are rated by the Florida Solar Energy Center (http://www.fsec.ucf.edu)

In order to prevent system over sizing, tank size must be 1.10 gallons for every square foot of collector installed. The max collector size allowed in the program is calculated at 0.7 ft^2 or collector per GPD water draw. The following GPD Water draw calculations will be accepted:

1. ***ASHRAE method - The ASHRAE method can be found in the Applications ASHRAE handbook.***
2. ***Bedroom Method - Assumes the first bedroom in a unit consumes 20 GPD, the second bedroom 15 GPD, and each additional bedroom within the unit 10 GPD.***
3. ***SDREO Approved Engineering Calculations – Building GPD calculations must be signed by a registered professional engineer, verified and approved by SDREO***.

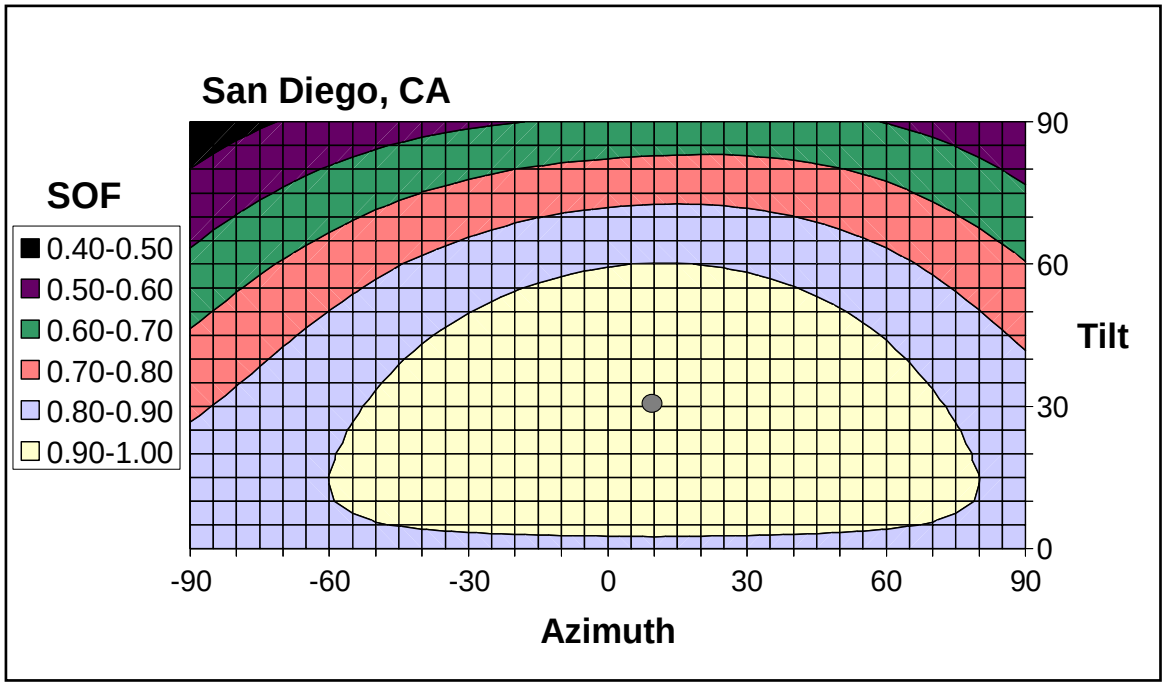
Additional requirements for adequate freeze protection, PRV location, water flow, drain back, collector isolation for system maintenance, thermal bleed valves, etc will be detailed in the program handbook.

Max incentive closed loop and open loop- $75,000

Max incentive for pools - $30,000

7 APPENDIX B

Example of Solar Orientation Factor Chart for San Diego



8 APPENDIX C

Draft SWH Pilot Program Checklist

SWH Pilot Program Proposed Installation Checklist		
Line	**Description**	**Requirement**
1	Collector Exposure	Unshaded / Orientation
2	Multiple Collector Collection Method	Parallel
3	Collector Mounting Brackets	Manufactured / Number / Sealed / Fasteners / Secure
4	Collector Leg Sets	Manufactured / Braced / Fasteners / Secure
5	Collector Support Structure	Non-Corrosive / Spacing / Fasteners
6	Support Structure Anchoring Fasteners	Number / Location / Frequency / Secure
7	Collector Sensor Attachment	Clampled / Sealed / Taped / Location
8	Clearence from Roof	Collector / Support Structure
9	Collector Pressure Relief Valve	Watts 3L, Other
10	Roof Penetration Sealed	Piping / Electric / Fasteners
11	Roof Sealing Method	
12	Roof Piping	Supports / Adhered / Frequency / Bands
13	Roof Piping Insulation	UV Protected
14	PV Make / Model / Wire Size	
15	Collector Mounting Method	Lag / Lag with Cup / Hanger / Rod / Other
16	Tank #1 Make / Model / Age	
17	Tank #2 Make / Model / Age	
18	Tank #3 Make / Model / Age	
19	Multiple Tank Collection Method	Series / Check Valve / Location
20	Tank Cover Plates / Warning Labels	Accessible / Visible
21	Tank Heat Loop	< or = to 12" / Secure
22	Tank Sensor Connection	Clamped / Sealed / Taped / Stud / Location
23	Tank Thermostat Setting	< or = to 120 deg. Farenheit
24	Tank Support	Slabs / Bricks / Shims / Stable
25	Tank TPR	Watts 100XL Other / Tight
26	Tank Overflow Line	Attached / Tight
27	Pump	UP15-18SU 0068C4 Other / Accessible
28	Controller	DOT94 GL30-LCO Other / Accessible
29	Controller Setting	Automatic
30	Time Switch	WH-40 4004-71 Other / Accessible
31	Time Switch Setting	On Off / On Off
32	Temperature Gauge / Temperature	Litro SL2D Pasco 1449 Other
33	Plumbing Material	Piping / Fittings / Valves
34	Isolation Valve Type	Ball / Isoflange
35	Isolation Valve Location	CWL / LSSL / USSL / SRL
36	Check Valve	Swing / Horizontal / Location
37	Pipe Supports	Material / Frequency / Bends
38	Fastening Hardware	Stainless Steel
39	Piping Insulation	SSL / SRL / HWL / CWL / Overflow Line
40	Wall / Ceiling Penetrations	Pipe / Wire
41	Isulation Joints	Sealed / Butted / Packed
42	System Design Type	Top / Side / Bottom / Multiple / Other
43	Overall Installation	Workmanlike
44	System	Operational
45	Inspection Results	System

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the *San Diego Regional Energy Office Submittal of the Solar Water Heating Pilot Proposal for the California Solar Initiative, Pursuant to D.06-01-024* on all known parties of record in this proceeding by delivering a copy via email to the current service list.

Executed on May 26, 2006.

Irene M. Stillings
Executive Director
San Diego Regional Energy Office
8520 Tech Way, Suite 110
San Diego, CA 92123
Tel: (858) 244-1192
Fax: (858) 244-1178

R.06-03-004 Service List

david.kopans@fatspaniel.com
keith.mccrea@sablaw.com
doug.larson@pacificorp.com
lglover@solidsolar.com
spatrick@sempra.com
hchoy@isd.co.la.ca.us
susan-munves@smgov.net
mluevano@globalgreen.org
steve@energyinnovations.com
amber.dean@sce.com
case.admin@sce.com
mike.montoya@sce.com
rkmoore@gswater.com
michaely@sepcor.net
irene.stillings@sdenergy.org
susan.freedman@sdenergy.org
mjskowronski@inlandenergy.com
rod.larson@sbcglobal.net
pepper@cleanpowermarkets.com
freedman@turn.org
rmd@cpuc.ca.gov
ek@a-klaw.com
sls@a-klaw.com
jpross@votesolar.org
jwmctarnaghan@duanemorris.com
chrishilen@dwt.com
jsqueri@gmssr.com
jwiedman@gmssr.com
mday@gmssr.com
sarahtuntland@yahoo.com
rjl9@pge.com
ssmyers@att.net
l_brown123@hotmail.com
bkc7@pge.com
grant.kolling@cityofpaloalto.org
susank@bonair.stanford.edu
lex@consumercal.org
e.larsen@rcmbiothane.com
jharris@volkerlaw.com
carriec@greenlining.org
gmorris@emf.net
nonyac@greenlining.org
gary@sunlightandpower.com
tomb@crossborderenergy.com
arno@arnoharris.com
stephen@seiinc.org
michaelboyd@sbcglobal.net
julie.blunden@sunpowercorp.com
meganmmyers@yahoo.com
johnrredding@earthlink.net
michaelkyes@sbcglobal.net
vschwent@sbcglobal.net
cmkehrein@ems-ca.com
jjensen@kirkwood.com
atrowbridge@downeybrand.com
glw@eslawfirm.com
janmcfar@sonic.net
jluckhardt@downeybrand.com
wwwesterfield@stoel.com
kmills@cfbf.com
hfhunt@optonline.net
michelle.breyer@gs.com
obrienc@sharpsec.com
eyussman@knowledgeinenergy.com
ralph.dennis@constellation.com
cswoollums@midamerican.com
jimross@r-c-s-inc.com
ghinners@reliant.com
kjsimonsen@ems-ca.com
eshafner@solel.com
robert.pettinato@ladwp.com
cfaber@semprautilities.com
lurick@sempra.com
npedersen@hanmor.com
sendo@ci.pasadena.ca.us
slins@ci.glendale.ca.us
bjeider@ci.burbank.ca.us
roger.pelote@williams.com
mkay@aqmd.gov
paul.kubasek@sce.com
rishii@aesc-inc.com
liddell@energyattorney.com
mshames@ucan.org
scottanders@sandiego.edu
cmanzuk@semprautilities.com
jennifer.porter@sdenergy.org
jyamagata@semprautilities.com
nathalie.osborn@sdenergy.org
ofoote@hkcf-law.com
ekgrubaugh@iid.com
traceydrabant@bves.com
LowryD@sharpsec.com
lnelson@westernrenewables.com
gbeck@etfinancial.com
lfultz@unlimited-energy.com
mstout@unlimited-energy.com
mdjoseph@adamsbroadwell.com
diane_fellman@fpl.com
fsmith@sfwater.org
mhyams@sfwater.org
filings@a-klaw.com
tmorita@thelenreid.com
CEM@newsdata.com
david@pvnow.com
cp@kacosolar.com
jhamrin@resource-solutions.org
jtt8@pge.com
J1Ly@pge.com
jwwd@pge.com

LATc@pge.com
MNCe@pge.com
cpucsolar@rahus.org
tomhoff@clean-power.com
andy.vanhorn@vhcenergy.com
nellie.tong@us.kema.com
tony.foster@itron.com
phillip_mcleod@lecg.com
mrw@mrwassoc.com
rschmidt@bartlewells.com
jgalloway@ucsusa.org
robertg@greenlining.org
ksmith@powerlight.com
GLBarbose@LBL.gov
MABolinger@lbl.gov
rhwiser@lbl.gov
Dan.Thompson@SPGsolar.com
bmcc@mccarthylaw.com
sberlin@mccarthylaw.com
chrism@mid.org
mwalpert@pacpower.biz
lmerry1@yahoo.com
rmccann@umich.com
gpickering@navigantconsulting.com
lpark@navigantconsulting.com
vfleming@navigantconsulting.com
scott.tomashefsky@ncpa.com
sfrantz@smud.org
karen@klindh.com
markgsp@sbcglobal.net
deb@a-klaw.com
kyle.l.davis@pacificorp.com
George.Simons@itron.com
mc3@cpuc.ca.gov
as2@cpuc.ca.gov
aes@cpuc.ca.gov
tam@cpuc.ca.gov
dsh@cpuc.ca.gov
dot@cpuc.ca.gov
cln@cpuc.ca.gov
jf2@cpuc.ca.gov
lp1@cpuc.ca.gov
rmd@cpuc.ca.gov
suh@cpuc.ca.gov
tdp@cpuc.ca.gov
vjb@cpuc.ca.gov
ppettingill@caiso.com
mscheibl@arb.ca.gov
gyee@arb.ca.gov
dks@cpuc.ca.gov
jewilson@energy.state.ca.us
pnarvand@energy.state.ca.us

San Diego
REGIONAL
ENERGY
OFFICE

June 16, 2006

California Energy Commission
Dockets Office, MS-4
Re: Docket No. 06-NSHP-1
1516 Ninth Street
Sacramento, CA 95814-5512

RE: Comments on the New Solar Homes Partnership Staff Proposal

The San Diego Regional Energy Office (SDREO) is pleased to provide the following comments on the draft staff proposal for the New Solar Homes Partnership (NSHP). We are actively participating in the CPUC proceeding on the California Solar Initiative (CSI) and have served as solar energy educators through the U.S. Department of Energy Million Solar Roofs Initiative since 1999. In addition, we are the only non-utility administrator of the Self Generation Incentive Program in the state.

SDREO is an independent, nonprofit 501(c)(3) corporation that helps residents, businesses and public agencies save energy, reduce grid demand and generate their own power through a variety of rebate, technical assistance and education programs. SDREO is working toward a sustainable energy future by providing the community with objective information, research, analysis and long-term planning on energy issues and technologies. Based on the draft staff proposal and discussions at the CSI workshops held on June 12-13, we focus our comments on two areas:

- Solar Water Heating for New Construction Developments
- Effective Solar Program for Affordable Housing Developments

Solar Water Heating for New Construction Developments

SDREO encourages the Energy Commission to consider inclusion of Solar Water Heating (SWH) at the start of its new construction program rather than waiting for the results of the SDREO SWH pilot for *existing* buildings. At a minimum, we would support integrating SWH into one or two production home developments in the SDG&E service territory as a more comprehensive pilot encompassing existing and new buildings. This way, performance and cost data could be assessed on new construction and retrofit projects.

The NSHP draft staff proposal currently states that the Energy Commission will monitor the SWH pilot. For background, the SDREO SWH pilot program is included as *Attachment A*. SDREO filed it with the CPUC on May 26, 2006 and the CPUC is currently seeking comment on it.[1] In it we stated that the pilot will provide rebates to residential and non-residential customers who install qualifying solar water heating systems that *offset* energy used by an *existing* natural gas or electric water heater or boiler. We have not included new construction to date because the Energy Commission has purview over the CSI new construction component.

It seems there exists a Catch 22 for solar water heating and thermal technologies in the CSI. We recognize that the Energy Commission Emerging Renewables Program (ERP) and subsequent NSHP program are funded from electricity distribution charges only and thus the staff proposal currently limits the program to solar electric systems. But can the value from deploying SWH outweigh the need for distinction of electric and gas program funds? Solar water heating is an energy efficiency measure with a renewable component, but the technology has lacked visibility in energy portfolios because it has not been defined as either an "energy efficiency" product or a "renewable self-generation" product. Additionally, SWH could offset natural gas or electricity usage depending on how the particular building is set up for service.

[1] Filed with the CPUC on May 26, 2006 under R.06-03-004. Open for comment at time of this letter.

The SWH pilot program is innovative in basic design by virtue of type of technology; it tangibly connects renewable technology to energy efficiency. In addition to financial savings and energy savings, SWH systems can help protect against future gas and electricity shortages and reduce our dependence on foreign sources of energy. Solar Water Heating systems also help preserve the environment by avoiding pollutants such as carbon dioxide, nitrogen oxide and sulfur dioxide. Solar Water Heating systems installed in place of existing electric water heating systems can also help reduce grid demand, thus reducing the need for new power plants.[2]

With regard to education and training, the NSHP draft staff proposal recognizes the need to overcome a negative perception and experience from the previous program in the 1980s.[3] The SDREO SWH pilot program proposal is designed to encourage the adoption of SWH technologies by not only providing financial incentives to assist with installation costs, but also training for installers and education to help potential customers make informed decisions. This type of education and training component could also be applied to a new construction production development. [4]

Integration of Affordable Housing Developments

SDREO believes it is important to find ways to reduce utility bills at low income and affordable housing developments through energy efficiency and solar energy systems. Presenters at the June 13 workshop on Affordable Housing and Low Income heavily stressed the need:

- For grants,
- To keep the program simple,

[2] Moreover, according to a 2003 PG&E study, solar water heating systems represent the largest untapped therm savings potential remaining in California with a savings potential of over 800 million therms, compared to the next largest savings opportunity of 300 million therms for horizontal clothes washers. [P.E-9&10, Coito, Fred and Mike Rufo, *California Statewide Residential Sector Energy Efficiency Potential Study*, April 2003 and *California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study*, Study ID#SW061, prepared for PG&E, Fred Coito and Mike Rufo KEMA-XENERGY Inc. Oakland, CA, July 2003.

[3] California Energy Commission *New Solar Homes Partnership* p.5

[4] Since we expect new construction costs to be lower versus retrofit, the rebate could likely be 30-35% less than what's identified in the SDREO Pilot proposal.

- To combine energy efficiency and solar incentives, without making qualifications too onerous,
- For a "blueprint" for how to effectively and seamlessly incorporate solar energy into planning and development of affordable housing projects, and
- For developers and financers to see successful examples in the field that would create some certainty that solar is both doable and worthwhile

At the workshop, *Solara* in San Diego was presented as the first large-scale affordable housing development to employ solar panels in the state; this means that California has yet to establish a completed successful blueprint for others to emulate. In the early stages of the CSI, it may be in the Energy Commission's best interest to focus program funds on the needs expressed by the affordable housing community (grants, blueprint, simplicity, peer-to-peer success).

CSI affordable housing blueprints could target a geographic area or type of development (mixed use, high rise, 3-4 story, etc.). The Energy Commission NSHP could work with established developers and the California Housing Partnership Corporation (CHPC) to create blueprints for these subsets of affordable housing. These blueprints could become the impetus for wider scale deployment of solar at affordable housing developments in subsequent program years, at which time limited panel availability issues hopefully will have been remedied and panel costs will be lower.

The Energy Commission also should take into consideration near-term factors that could hinder participation of affordable housing developers in a rebate program. Current limited availability of solar panels could result in increased costs for panels as well as project delays if panels become back ordered. Moreover, at the June 12 meeting, Commissioner Jackalyne Pfannenstiel and several speakers stressed the importance of a simple, not-overly-complex program. Verification of system components by multiple parties and superfluous paperwork could cause delays and a lack of interest in participation in the program. Considerations of issues like these will foster a successful rebate program that properly addresses the needs and constraints of the program participants.

Integrating energy efficiency measures with solar installations is a laudable goal, as mentioned by speakers at both the June 12 and June 13 meetings. Maximizing efficiencies will allow smaller solar systems to be installed, thus reducing the cost for the system. This is not only advantageous in peak demand reduction on California's grid, but would also be easier on Californians' wallets in that they will incentivize smaller solar installs. However, SDREO cautions that building efficiency standards not be overly stringent as to prevent participation in the program. It seemed that the San Diego *Solara* project, which exceeds California Code of Regulations Title 24 levels by 15%, is an achievable target.

Concluding Remarks

The San Diego Regional Energy Office would like to thank the Energy Commission for this opportunity to provide comments on the NSHP Draft Staff Proposal. Please fee free to contact us with any comments or questions or if SDREO may be of assistance.

Regards,

Susan Freedman
Senior Policy Analyst
Tel. 858-244-1186
Email. susan.freedman@sdenergy.org
Internet. www.sdenergy.org