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Comments of the California Solar Energy Industries Association on the Climate Change Draft Scoping Plan June 2008 Discussion Draft

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The California Solar Energy Industries Association (CAL SEIA) is pleased to provide comments on the June 2008 Discussion Draft of the Climate Change Draft Scoping Plan (the Draft Plan). CAL SEIA is a solar energy industry trade association with over 200 member companies, consisting of manufacturers, contractors, distributors, architects, engineers, consultants and individuals involved in California's solar energy industry. CAL SEIA represents all solar technologies.

CAL SEIA commends the California Air Resources Board (CARB) on its production of a first draft of a necessarily complex plan of action for reducing California's greenhouse gas (GHG) emissions. Although we recognize that a myriad of approaches will be required to achieve the goals set forth in the Plan, our comments will address only those topics related to solar energy.

1. CARB's Early Recognition That Distributed Solar Technologies Will Play an Important Role in Reducing GHG Emissions is Appropriate and Welcome

CAL SEIA notes that CARB has recognized the ability of solar energy technologies to contribute to the reduction of GHG early in the Draft Plan development process. CAL SEIA concurs with the general plan to include emission reductions from solar water heating (SWH) and photovoltaics (PV), as identified in Table 2: Recommended Greenhouse Gas Reduction Measures. As might be expected, however, CAL SEIA is very interested in the calculation methodologies used throughout the Draft Plan to quantify the emission reductions of both SWH and PV. We recognize that in this initial stage of the Draft Plan development these methodologies are still in refinement, and we offer our assistance to ensure the highest level of accuracy possible in this effort.

CALSEIA also recommends that CARB be mindful of the entire suite of solar technologies when it considers distributed solar technologies, including but not limited to photovoltaics, solar water heating, distributed solar thermal electric systems, solar space heating and cooling systems for both residential and commercial applications, and solar swimming pool heating. Distributed solar thermal electric systems are capable of providing multiple services, such as electricity, heated water for industrial or domestic use, and cooling.

Natural gas is used extensively to heat pools in school, public, municipal, hotel, and therapeutic applications. Most of these pools are heated year-round and therefore represent a significant opportunity to cost-effectively reduce GHG emissions.

2. The Draft Plan Correctly Recognizes the Value of Example-Setting by the State In Section II A; The Role of the State: Setting an Example.

The Draft Plan makes several recommendations about how the State can contribute to this effort and lead by example. CAL SEIA agrees. In January 2002, SBX2 82 took effect, adding Section 14684 to the California Government Code. The Legislative Counsel analysis of this legislation reads, in part:

> "This bill would require the department, in consultation with the commission, to ensure that solar energy equipment is installed, no later than January 1, 2007, on all state buildings and state parking facilities where feasible, as specified. It also would require solar energy equipment to be installed where feasible as part of the construction of all state buildings and state parking facilities that commences after December 31, 2002."

In January 2003, AB 1881 took effect, adding Section 14684.1 to the California Government Code. The Legislative Counsel analysis of the legislation reads, in part:

> "This bill would establish a program to require the Department of General Services in consultation with the Energy Commission to ensure that solar energy equipment for which the primary purpose is using solar energy for heat production be installed where feasible, as defined, no later than January 1, 2007. The bill requires such solar energy equipment to be installed where feasible as part of the construction of all state buildings and state parking facilities for which construction commences on or after January 1, 2003." (Emphasis added).

This legislation requires the state to take pro-active steps to install both PV and solar thermal technologies on State buildings and facilities, subject to the conditions set forth in state law enacted through the passage of the legislation. No additional legislative mandate is required for the State to "set an example" in this regard. In fact, the language requires the Department of General Services and the California Energy Commission to take concrete steps to ensure solar installations by dates already past. Designers of new state facilities and operators of existing facilities should be striving to find ways to comply with these laws, rather than attempt to demonstrate why the language of the laws exempt a particular building or facility from compliance.

Virtually all State buildings and facilities are good candidates for PV applications, and numerous State facilities that operate cafeteria, locker room or swimming pool heating facilities are excellent candidates for solar thermal technologies. In particular, large swimming pools typically used in college, municipal, and hotel settings are frequently heated on a year round basis. These Olympic-size pool facilities typically operate natural gas-fired heaters which

consume as much as 40 therms/hour of natural gas, emitting at least 460 pounds of CO_2 per hour.[1]

In some areas of the state (Sacramento, for example) the state uses 'district heating and cooling,' which also offers opportunities for the state to achieve GHG emission reductions through use of solar thermal technologies.

3. Emission Reduction Measures: Barriers to Use of Solar Technologies

The Draft Plan correctly identifies the need for measures which "address barriers that would not be overcome solely by means of a market approach."[2] Certainly, solar technologies fall into this category. Notwithstanding the State's aggressive utilization of incentives to promote the use of PV technologies, an inescapable fact is that solar technologies (with the exception of those utilized in off-grid applications) are redundant by design. That is, buildings and facilities are designed to function with or without the solar energy input. This means that an active decision-making effort must be made by facility designers or operators before a solar system of any type is employed, and in order to achieve the objectives of GHG emission goals, these decisions must be made irrespective of whether the proposed project economics based on today's energy prices are attractive or not.

In these circumstances, the Draft Plan must identify means and mechanisms to cause facility designers and operators to utilize a technology which they would not otherwise be inclined to include. The Final Plan must identify outreach and education activities which can overcome this lack of inertia. Two notable examples include solar water heating systems for applications where electricity consumption is offset, and solar swimming pool heating on state facilities. Both of these applications are cost-effective by any measure today, yet the use of these systems on many eligible facilities is virtually non-existent. The decision of a designer to not use a PV or solar thermal technology in new buildings represents a lost opportunity worth addressing, especially if the designer was unaware that a technology was cost-effective and therefore omitted it from the project design.

CAL SEIA Comments by Section
Preliminary Recommendation, Section II B

Subsection 3. Energy Efficiency
CAL SEIA concurs that the first loading order should be energy efficiency, as proposed in this Section. However, energy efficiency only reduces consumption of either electricity or natural gas, it does not produce energy. Also, energy efficiency benefits are highly affected by user behavior. Persistent GHG reductions through energy efficiency are best achieved in

[1] 4 million BTU/hr natural gas input equals 40 therms/hour. Minimum 11.5 lbs./therm CO_2 production.
[2] Draft Scoping Plan; Section II B, Emission Reduction Measures, pg. 13

combination with renewable energy generated as close as possible to where the energy is to be used.

SWH technologies are included as an energy efficiency technology in Table 2 on Page 11, and throughout the Draft Plan. CALSEIA strongly support the Draft Plan's recognition that SWH can reduce the consumption of natural gas for water heating purposes in significant quantities. CALSEIA notes that SWH technologies which offset the consumption of natural gas by generating heat have traditionally been consigned to a "no-man's land" between energy efficiency and generation, depending on the proceeding at hand at the Energy Commission or Public Utilities Commission. We believe that SWH is renewable energy generation, and is in a different category from other traditional energy efficiency technologies in that it produces energy, unlike efficiency measures. This is an important consideration that is not currently accounted for in existing energy efficiency evaluation methodologies when solar water heating is ranked against energy efficiency measures that only reduce the consumption of energy.

AB 1470 (Statutes of 2007) is the California Water Heating Energy Efficiency Act. CAL SEIA has been closely involved in the AB 1470 legislative and regulatory proceedings from the earliest stages, and is strongly committed to help make a statewide SWH program a success. For purposes of GHG reductions, CALSEIA believes that the goal of 200,000 SWH systems over ten years represents a bare minimum objective, particularly in light of the fact that many countries in Europe, and elsewhere, with populations a fraction of that in California, are presently installing orders of magnitude more systems than are currently being installed in the state. If the country of Austria, for example, with a population of approximately 8 million, and a climate similar to Chicago, can install approximately 280,000 square meters of solar thermal equipment, as was accomplished in 2007,[3] surely California can achieve better than the estimated volume in 2007 of 6,000 square meters. The Final Plan should aspire to higher goals than those set by AB 1470.

By CAL SEIA's calculations, and based on an average 235 therms per year of natural gas consumption per residential water heater and 11.5 lb./therm CO_2 combustion product, each natural gas-fired residential water heater would emit approximately 2,700 lb./year of CO_2. A SWH would reduce that amount by 60% to 75%. This would appear to yield at least a 0.162 $MMTCO_2E$ reduction with an AB 1470 build out in 2020. CALSEIA recommends that Table 6 be modified to reflect this higher value for GHG reductions through SWH. NREL has produced a Technical Report on this topic.[4]

With respect to Green Buildings, CAL SEIA applauds the recognition of highly energy efficient building construction materials, products, and construction techniques in the Draft Plan. The Scoping Plan references the Leadership in Energy and Environmental Design (LEED) standards.

[3] See: http://www.estif.org/fileadmin/downloads/Solar_thermal_markets_in_Europe_2007.pdf
[4] http://www.nrel.gov/docs/fy07osti/41157.pdf

CALSEIA recommends that the LEED standards be reviewed to ensure that they are appropriate to California. For example, the LEED standards assign a point system for building construction that may or may not correctly capture the attributes of renewable technologies. Recent changes to the LEED standards will take effect in January 2009. Relying on a LEED standard should be done in a manner that is mindful of the fact that "state of the art" standards will be upgraded over time. If the current LEED standard does not adequately quantify the benefits of a new technology, that technology may be ignored merely because its attributes were not quantified when the LEED point system was developed.

More important than LEED is the California Public Utilities Commission Decision to require that new homes be built to zero net energy standards by 2020.[5] A number of our member companies have had the opportunity to interact with the US Department of Energy and the National Renewable Energy Laboratories in their effort to advance the concept of Zero Energy Buildings (ZEB). A ZEB employs the use of the widest possible range of cost-effective energy efficiency products and construction techniques first, and after incorporating them into a building design adds SWH and PV to make up the difference between a highly energy efficient building and a ZEB.[6] It is useful to note that a ZEB cannot be achieved without the availability of net metering for PV (available in California) and SWH.

Also of note is the advent of the US DOE's inclusion of high efficiency domestic water heaters, including solar water heaters, in the Energy Star program.[7] The Energy Star Residential Water Heater Program is due to commence operations on January 1, 2009. Along with a minimum solar fraction requirement of 50%, complete systems will be required to be rated and certified by the Solar Rating & Certification Corporation (SRCC) under its OG-300 system certification protocol.[8] California's Title 24 Residential Building Energy Efficiency Standards recognize the energy contribution of SWH systems, and also require certification by SRCC.[9] CAL SEIA supports the utilization of SRCC Certification as a measure of accurate performance estimation, as well as appropriate system design.

Regrettably, the 2008 Title 24 Building Energy Efficiency Standards now under final development will apparently not include provisions for recognizing the energy production from photovoltaic systems. On the other hand, the California Energy Commission's New Solar Homes Partnership is designed to support the installation of PV systems on new residential construction and the New Solar Home Partnership does not recognize energy production from SWH. CALSEIA recommends that the omission of PV from the Building Standards and the

[5] Decision 07-10-032 October 18, 2007
[6] http://www1.eere.energy.gov/buildings/goals.html
[7] http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/water_heaters/WaterHeaterAnalysis_Final.pdf
[8] www.solar-rating.org
[9] http://www.energy.ca.gov/2005publications/CEC-400-2005-005/chapters_4q/5_Water_Heating_Requirements.pdf See pg. 5-15

omission of SWH from the New Solar Homes Partnership be corrected to ensure that GHG reductions are not lost due to administrative omission.

CAL SEIA also notes that SWH which offsets electrical water heating is very cost-effective today. The Final Scoping Plan should recognize this fact and encourage the use of SWH to offset electric water heating. While electric water heaters are relatively few in California, the opportunity should not be overlooked. Accordingly, Table 6: Energy Efficiency Preliminary Recommendation – Electricity on Page 23 should include SWH.

Section 4: Renewable Portfolio Standard

CAL SEIA supports a Renewable Portfolio Standard (RPS) that recognizes the contribution from all renewable energy sources, including all distributed renewable energy sources, regardless of facility size. Certainly distributed solar technologies fall within this category. However the RPS as it is now structured limits sales to electricity retailers toward the RPS obligation. As the Draft Plan notes in Section A. 4 (Development of the GHG Emission Reduction Strategy, page 6): "In some cases legislative action may be necessary." There is precedent for distributed generation eligibility in other states.[10] The Air Resources Board may wish to examine statute as it relates to the RPS to determine if legislation is needed to ensure that all renewable technologies are counted toward RPS requirements.

Section 8: Water

In this section, in Table 12: Water Preliminary Recommendation on Page 29, it is not clear what is contemplated in Measure W-5 (Increase Renewable Energy Production).

Section 12: Million Solar Roofs Program

CAL SEIA believes current efforts to develop a "feed in tariff" for PV systems should be monitored and incorporated into the Draft Plan as work progresses to establish such a state policy. A feed in tariff is a contract between an energy developer and a utility to provide power. Feed in tariffs have been successfully used in Europe to greatly expand the use of renewable energy. The Million Solar Roofs Program/California Solar Initiative encourages the use of solar (PV only) on the retail side of the customer meter and is limited to projects no larger than 1 megawatt. The state has recognized a market gap for distributed renewable generation projects that are below 20 megawatts. [11] While not yet enacted, it is useful to note that SB 1714 (Negrete-McLeod)[12] is pending in the California Legislature and would direct the California Public Utilities Commission to establish a feed in tariff that values renewable energy attributes. A successful feed in tariff could significantly expand opportunities to reduce GHG emissions in California.

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[10] http://www.dsireusa.org/summarytables/reg1.cfm?&CurrentPageID=7&EE=1&RE=1

[11] http://www.energy.ca.gov/portfolio/documents/2008-06-30_workshop/2008-06-30_TRANSCRIPT.PDF

[12] http://leginfo.ca.gov/pub/07-08/bill/sen/sb_1701-1750/sb_1714_bill_20080702_amended_asm_v95.pdf

Section 13: Local Government Actions and Regional Targets

CAL SEIA believes that Local Government Actions represents one of the most important aspects and opportunities identified in the Draft Plan, due in large part because it is local government which will have to take ownership of the variety of identified measures, including solar energy requirements for their communities. From a solar perspective, enlightened Community Energy and Community Design practices hold the most promise for increasing the deployment of all solar technologies. The National Renewable Energy Laboratory has published a comprehensive document on this topic.[13]

One of the more daunting issues with respect to implementing renewable energy programs has been permitting at the local level. Permit fees and requirements that are not based on State Building and Safety Codes have thwarted the construction of local renewable energy projects. Homeowners' Associations throughout the state have historically created obstacles to increasing the use of new renewable technologies. CALSEIA recommends that a program to establish Local Government Actions and Targets include a review of permitting and fees for solar energy systems and green building practices to ensure that GHG goals can be realized.

Section II C: Other Measures Under Evaluation

In Table 22: Estimated Potential Emission Reductions From Measures Under Evaluation, the Draft Plan correctly anticipates that the current solar energy system installation goals for the state have considerable room for expansion, particularly in light of aggressive solar deployment activities elsewhere the world. CAL SEIA concurs that it is not unreasonable to expect that a 66% increase of California's current PV goal, 3,000 MW, could be achieved by 2020. Nor is it unreasonable to envision a six-fold increase in the use of SWH systems, particularly given our favorable climate and our substantial lag behind other developed countries.

Section II C 3. Offsets

CAL SEIA strongly supports the development of a strategy which will allow for and encourage the use of offsets to meet GHG reduction goals and obligations.

> **Dairies as an Example**
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> It would appear that the example of dairies in California could illustrate the value of a compliance offset component to the Draft Plan. Dairies are apparently acknowledged as a significant source of GHG emissions, largely in the form of methane, yet due to the difficulty in containing these emissions it is not clear how or when this source can be regulated. However, dairies use significant quantities of heated water in their operations.[14,15] A SWH system which reduces emissions from water heating operations could be used to partially offset methane emissions at the site.

[13] See: http://www.nrel.gov/applying_technologies/pdfs/42774.pdf
[14] http://www.omafra.gov.on.ca/english/engineer/facts/06-061.htm
[15] http://learningstore.uwex.edu/pdf/A3784-2.pdf

Similarly, numerous hotels and other facilities operate swimming pools which are heated on a 24 hour per day basis. The installation of a solar swimming pool heating system would allow the operator to accumulate emission reduction offset credits, which could conceivably be tradable and therefore of value. The Draft Plan contemplates limiting the use of compliance offsets to the cap and trade system, however this may not allow for innovative applications of solar and other technologies on facilities that would not normally be eligible for the cap and trade system due to their relatively small size. CAL SEIA recommends that the Final Plan include a provision that smaller facilities be able to participate in any offset program which is developed.

Utilities and other business sectors could implement programs to increase the use of solar water heating and PV systems within their service territories under a cap and trade program. Note that according to the inventory of GHG emissions, residential natural gas emissions are nearly as high as GHG emissions from California's refineries.[16] Providing this flexibility for compliance will help encourage business to look for new opportunities that can help business cost-effectively meet the requirements of the GHG emission caps.

Measurability of Offsets

The energy production of solar technologies is measureable and verifiable. PV system energy production measurement is straightforward through the use of commonly available electric metering devices. Solar thermal technologies are also easily metered through the use of "BTU meters." Section 12, Appendix B of the California Solar Incentive Program Handbook addresses system energy production metering, including Thermal Metering.[17]

SUMMARY

CAL SEIA appreciates the opportunity to provide these comments. To summarize our recommendations:

1. State buildings should set the example and expedite installation of PV and SWH systems on all state buildings as soon as possible.
2. Ensure that Energy Efficiency measure implementation be undertaken in a manner that ensures persistent GHG reductions through the combination of energy efficiency and renewable energy generated as close as possible to the point of use.
3. CALSEIA recommends that the omission of PV from the Building Standards and the omission of SWH from the New Solar Homes Partnership be corrected to ensure that GHG reductions are not lost due to administrative omission.
4. Energy efficiency must include renewable technologies to achieve Zero Energy Buildings and LEED should be reviewed for its applicability in California before adopting.

[16] http://www.arb.ca.gov/cc/inventory/data/forecast.htm

[17] http://www.cpuc.ca.gov/NR/rdonlyres/015DEF42-FA87-49FC-BAE3FD77154DF8A1/0/Feb_2008_CSI_Handbook_Update.pdf

5. Identify means and mechanisms to cause facility designers and operators to use a technology which they would not otherwise be inclined to include.
6. Include outreach and education activities to overcome objections to using GHG reduction technologies.
7. Expand the goals for using distributed Solar Thermal Electric, SWH and PV to reduce GHG emissions.
8. Review the RPS statute to determine if legislation is needed to ensure that all distributed renewable projects are counted toward RPS and GHG targets.
9. Task local governments with reviewing permitting and fees for renewable and GHG measures to ensure that barriers to the use of renewables are removed.
10. Encourage "tradeable offsets" where renewable energy projects can be used to offset GHG emissions.

We strongly support the development of a GHG mitigation program for California, and will continue to participate in the proceedings leading up to the Final Scoping Plan for this effort. CALSEIA appreciates the opportunity to provide these comments.

Sincerely,

Sue Kateley
Executive Director