CALIFORNIA SOLAR ENERGY INDUSTRIES ASSOCIATION
916-747-6987 info@calseia.org
P.O. Box 782, Rio Vista, CA 94571

Comments of the California Solar Energy Industries Association on the Draft AB 32 Scoping Plan Appendices

August 11, 2008

The California Solar Energy Industries Association (CAL SEIA) is pleased to provide comments on the June 2008 Discussion Draft of the Scoping Plan Appendices (the Draft Appendices). 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 the draft Scoping Plan and its associated Draft Appendices for reducing California's greenhouse gas (GHG) emissions. CAL SEIA earlier submitted comments[1] on the Draft Scoping Plan itself; herein our comments will address topics in the Draft Appendices related to solar energy.

1. **While most of CAL SEIA's comments will focus on Electricity and Natural Gas-related topics, we note the following items related to Local Government Actions:**
   A good example of GHG reduction through ***Community Energy*** and ***Community Design***[2] is the ***Drake Landing Solar Community***[3], which demonstrates the type of innovative thinking regarding which CARB advocates for in new residential communities.

   Indirect Source Rules for New Development[4] are contemplated for mitigation of GHG emissions from new, high transportation carbon footprint residential developments. We suggest that the use of solar water heating (SWH) or photovoltaics (PV) within the context of this Measure under Evaluation may be appropriate. In the late 1990s CAL SEIA worked with the South Coast Air Quality Management District to develop just such an indirect source rule targeting NO_x emissions from residential water heaters. Although no rule was adopted through this effort in favor of a series of reductions in the maximum allowable NO_x emissions from gas fired burners, and since the District had no charter to address CO_2 emissions at the time, the effort was not pursued. New priorities could lead to a re-examination of this topic.

[1] Comments of the California Solar Energy Industries Association on the Climate Change Draft Scoping Plan June 2008 Discussion Draft; August 1, 2008
[2] Local Government Actions, pg. C-42
[3] http://www.dlsc.ca/
[4] Local Government Actions, pg. C-47

2. **Electricity and Natural Gas GHG Reduction Measures; Cap and Trade**
   CAL SEIA supports of the recommendations, with one exception, made by the Western Climate Initiative and referenced in the Cap-and-Trade Program outline set forth in the Draft Appendix C concerning residential and commercial natural gas customers, and reads in part:

   > *"The WCI also proposes that emissions from residential, commercial, and industrial natural gas users be included in the cap-and trade program. Large users of natural gas would have a direct regulatory obligation under the program based on their facility emissions. WCI recommends that for small users (such as residential and commercial natural gas customers), the emissions be phased into the program, with the point of regulation being the natural gas local distribution companies (LDCs). These LDCs would have the compliance obligation under the cap-and-trade program."* [5]

   CALSEIA's exception to the WCI recommendation is that small users should be immediately made part of the program. There is no need to phase in small users and, in fact, significant opportunities will be lost if it takes years to phase in a small users. The cap-and-trade provision could allow for the development of solar energy programs at the residential and commercial end-use distribution levels. Reductions in area-wide emissions from numerous small sources could have a significant positive impact on the success of the natural gas component of Cap-and-Trade.

3. **Electricity and Natural Gas GHG Reduction Measures; (E-1 and CR-1) Energy Efficiency and Conservation**
   - **Zero Net Energy Buildings**
     CAL SEIA supports the inclusion of the Zero Net Energy Buildings (ZNEB) topic in this section, and offers some history on the origination of the concept:

     In 1999, the Solar Buildings Team at the US Department of Energy[6] began to develop a concept called Zero Energy Buildings (ZEB) as a means to stimulate interest in solar technologies in general, and solar water heating technologies specifically (at the time, the Solar Buildings Program was specifically focused on R&D and other activities with the goal of increasing the deployment of solar thermal technologies, primarily for water heating purposes). Although the concept of a ZEB had existed within DOE for some time within the Office of Building Technologies, no specific effort to elevate the concept to an "Initiative" level had yet occurred at that time. In 1999, the market for solar water heating systems was stagnant, and the market for grid-connected photovoltaic systems was nascent. Development of the ZEB concept was envisioned as a good way to attract attention and support of an effort

[5] Cap-and-Trade Program, pg. C-59
[6] Today, the DOE Solar Heating & Cooling Program

which, as conceived, would by necessity incorporate three key features:

1. Enhanced energy efficiency (building materials and construction techniques, as well as appliances)
2. Solar water heating
3. Grid-connected Photovoltaics

As envisioned nearly ten years ago, the effort to achieve a "true" ZEB would first focus on energy efficiency strategies for lowering the energy consumption of a structure to (some) point where additional energy efficiency improvements would have an increasingly diminishing ability to add further value cost-effectively. At that point, solar water heating, as the more cost-effective renewable energy technology, would be included; and finally photovoltaics, as the highest cost feature, would be added to the extent required to reach the zero energy goal.

Notwithstanding the California Energy Commission's decision to focus virtually exclusively on photovoltaic technologies in its New Solar Homes Partnership Program, CAL SEIA believes that opportunities exist for both solar thermal and PV technologies in the new construction arena. Just as in the formulation and adoption of building energy efficiency protocols, where the most cost-effective measures are applied first, the same reasoning should apply in the pursuit of Zero Net Energy Buildings.

Further, in the California residential construction arena, an overwhelming majority of new homes constructed today use natural gas for both space and water heating, neither of which can be addressed by PV technologies without migrating to electricity based heating technologies. Similarly, small scale solar thermal technologies cannot provide on-site electricity. Achieving the goal of true ZNEB will require both technologies, as will the logical extension of the ZNEB concept – Zero Net Energy Neighborhoods.

- **(CR-2) Solar Water Heating**
  CAL SEIA agrees with the opening statement in this section: "Solar water heating systems represent what is likely the largest untapped potential for natural gas savings in California."[7] It is refreshing to see recognition of solar thermal technology in the Draft Scoping Plan and in Appendix C. CALSEIA supports the Expanded Solar Water Heating envisioned in Measures Under Evaluation.

  We applaud your support of the fully implemented AB 1470 Solar Water Heating

[7] Appendix C, pg. C-68

Program,[8] and hope for a rapid conclusion of the "Pilot Program," particularly in light of the ubiquitous use of SWH elsewhere in the US and the world, and of the lack of similar limited geography "Pilot Program" requirements for other emerging technologies.

Other comments on Solar Water Heating are as follows:

- CAL SEIA believes the definition of "solar water heating" should be expanded to include space heating, which in many cases uses identical solar collectors as are used in domestic water heating, as well as solar swimming pool heating, which mitigates a highly energy-intensive application of natural gas-fired water heating. Numerous swimming pools around the state are heated 24/7 on a year round basis. As stated in our August 1, 2008 comments on the Draft Scoping Plan,[9] large 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 CO2 per hour.

- Notwithstanding our comments herein, we note that while residential applications of SWH are well-addressed in the Draft, there is no mention of solar water heating for commercial or industrial applications. In our August 1, 2008 Comments on the Draft Scoping Plan we made reference to the applicability of SWH for dairy operations, where significant quantities of heated water are used.[10] Many other large-scale water heating applications are suitable for the incorporation of SWH, including cafeterias, restaurants, laundries, multi-family housing employing central water heating, process water heating for commercial and industrial operations, for example.

- CAL SEIA concurs that the use of a solar domestic water heating system "cuts the need for conventional water heating by about two-thirds."[11] However, we believe that the amount of therms saved by that measure should reflect a baseline consumption of an average of 235 therms, resulting in an average savings of 155 therms per year, rather than the 130 therms used in Draft Appendix C,[12] particularly in light of the significant decrease in gas water heater efficiency over time.

[8] CALSEIA notes that the Appendix, on page C-69, incorrectly cites Public Utilities Code Section 2860 by adding the word "Hot." The correct citation from Section 2860 is the "Solar Water Heating and Efficiency Act of 2007" (emphasis added)
[9] CALSEIA Comments: Draft Scoping Plan, August 1, 2008 Page 3 of 9
[10] Ibid, pg. 7 of 9; "Dairies as an Example"
[11] Appendix C, page C-69
[12] Ibid

- CAL SEIA believes that the estimated costs used by ARB staff in their analysis ($6,500 for retrofit applications and $3,000 for new construction), may not reflect actual prices over time. We suggest using a range of $4,000 to $6,500 for retrofits, and $2,500 to $4,500 for new construction. This will reflect the fact that not all systems are priced or configured in the same manner and that as installation volume increases there will be increased installation efficiency and lower marketing costs, thereby achieving lower installed costs.

- The language preceding Appendix C; Table 13 would seem to differ from the AB 1470 build-out measure cost of $292 million for SWH in the upper "Preliminary Recommendations" portion of the table, and is the same value as that of the lower "Measures Under Consideration." We assume the upper value should be zero, as in Table 14 on page C-72.

- CALSEIA also cautions the ARB and other state agencies to avoid comparing energy efficiency technologies with energy generation technologies. For example, comparing emission reduction potential from a tankless water heater against a SWH is an apples to oranges comparison. A tankless water heater is an energy consuming device. It does not generate energy. SWH generates thermal energy and therefore does not use a GHG-emitting fuel to deliver an energy service. A tankless water heater cannot always be assumed to reduce on-site natural gas consumption because the amount of natural gas that it uses will vary by individual usage patterns. This is not the case for SWH. To create persistent lower GHG emission reductions, CALSEIA believes that the ARB must use renewable energy generation technologies.

(E-4) Million Solar Roofs Program

CALSEIA is pleased and supports the ARB's recognition that the net metering cap on solar projects should be increased to facilitate an expanded use of solar technologies in California. The ARB's measure under evaluation, to expand the Million Solar Roofs Program to 5,000 MW by 2020 is also supported by CALSEIA.

The ARB may need to revise the estimated net annualized costs for both PV and SWH if the federal solar tax credits are extended. CALSEIA would like to work with the ARB staff further on the costs estimates to ensure that the annualized costs and potential CO2 emissions reflect the current capabilities of these technologies. New measurement and performance studies will be coming from the CPUC in its administration of the CSI PV and SWH programs. The ARB may want to monitor these studies to ensure that current costs and performance values are used.

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.