



# DOCKET

09-IEP-1A

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California Energy Commission  
Dockets Office, MS-4  
Re: Docket No. 09-IEP-1A  
1516 Ninth Street  
Sacramento, CA 95814-5512

Subject: Docket Number 09-IEP-1A: "Draft 2009 IEPR"

Dear CEC Staff:

Thank you for the opportunity to provide comments on the 2009 Draft Integrated Energy Policy Report.

PVT Solar is a Khosla Ventures supported company that offers a comprehensive and cost-effective hybrid solar energy solution currently selling in the market. Our **echo**<sup>TM</sup> solar energy system captures waste heat from PV installations that provide renewable electricity and uses it to provide

1. Solar water heating (SWH),
2. Solar space/home heating,
3. Radiant night sky cooling; and,
4. Solar thermally-driven cooling.

PVT Solar appreciates the opportunity to provide the following comments on CPUC's Draft Solicitation Package Proposal.

### **Summary of PVT Solar Recommendations for the IEPR**

1. Promote cost-effective comprehensive energy solutions over cost-effective but partial energy solutions and drive toward ZNE goals by providing incentive premiums for systems that address greater than a target percentage of the building's energy use—maybe 50% or higher.
2. Promote energy solutions that maximize a building's energy generation assets, such as rooftop space, by providing incentive premiums for systems that produce more energy per square foot of rooftop space.
3. Expand the CALRES building efficiency model to account for active solar space heating, not just solar water heating, to accurately reflect the full energy benefit of solar CHP systems.
4. Re institute incentives under the SGIP program to address solar combined heat and power systems such that these incentives exceed incentives that might be obtained in separate application under the CSI electrical and thermal programs.
5. Discuss the role of thermal energy storage on the consumer-side of the energy equation and recommend incentives for thermal energy storage and the control of thermal energy in the building to reduce peak building energy demand.

## **Whole Building Energy Approaches**

### **1. Incentive structures to encourage comprehensive energy solutions**

Whole building energy approaches for retrofits and new construction are critical in moving towards the State's energy efficiency goals, particularly zero net energy goals. Current incentive programs target specific technologies and often specific applications and do not encourage whole building approaches to energy efficiency. Market-ready solar hybrid electric – thermal renewable energy systems are available but no single incentive structure exists to promote these systems over simpler systems that generate only electricity or only a specific use of thermal energy, such as solar water heating. The number of cost-effective, renewable energy technologies providing partial energy solutions is growing, and partial energy solutions, once installed, can create a barrier for cost-effective, comprehensive energy solutions. The Policy Report needs to address the burgeoning need to promote cost-effective, comprehensive energy solutions over cost-effective but partial energy solutions.

A building's solar energy generation is limited by its rooftop space. Incentive programs that promote simple solar water heating systems use that valuable rooftop asset to generate only 13% of the home's energy, whereas an incentive structure promoting a whole-building energy approach would encourage hybrid solar systems that can generate 60-75% of the home's energy use. Incentives for systems that use valuable rooftop space to provide 13% of the home's energy encourage stop-gap energy efficiency measures that will need to be replaced with comprehensive energy solutions if the State is going to meet its efficiency goals. We encourage the Policy Report's whole-building energy efficiency approach and encourage that it underscore the importance of maximizing a building's energy generation assets such as rooftop space. This can be accomplished by providing incentive premiums for technologies that generate more energy per square foot of rooftop space.

### **2. Zero Net Energy Homes**

We support the Policy Report's recommendation that building energy efficiency standards be expanded to address building-scale renewable energy solutions. Furthermore, we encourage that the Policy Report recommend expanding the current building energy efficiency models to include active solar space heating. Currently, the home energy efficiency model, CALRES, considers only solar water heating and not solar space heating, whereas the Rem/Rate model used for IECC compliance in most other states considers both solar water and solar space heating as well as solar electricity generation. To achieve zero net energy, California building energy efficiency models must be expanded to account for all renewable energy generated.

A cost-effective solution to net-zero-energy homes is very close at hand. Solar combined heat and power systems can address 60-75% of the a home's energy use and are capable of integrating other technologies, such as desiccant cooling, that address the remaining home energy loads. We estimate that about 90% of the home's energy use can be cost-effectively addressed today with solar CHP, efficient building construction, and energy-efficient HVAC, appliances and lights.

### **Combined Heat and Power**

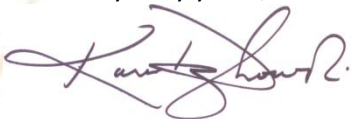
We support the Policy Report's recommendation to reinstitute eligibility for renewable CHP systems with generating capacities of 5 MW or less that meet minimum performance, monitoring and reporting standards, regardless of technology. Currently the Self Generation Incentive Program does not provide incentives for solar technology, including solar combined heat and power. Solar CHP systems can receive incentives from the CSI program, but this program does not consider the thermal benefits of these systems. To encourage solar combined heat and power systems, a single incentive program valuing the thermal and electric benefits of these systems is needed. The SGIP program could be modified to provide incentives that would favor CHP installations over simple PV or solar water heating installations.

### **Energy Storage**

The Policy Report focuses on the role of electrical storage on the utility-side of the energy equation. We encourage that the Policy Report also explicitly address the role of thermal energy storage on the consumer-side. Thermal energy storage is the most efficient means to store energy and offers a cost-effective means to achieve low-peak homes via thermal load shifting. Currently HVAC systems are designed for peak heating and cooling loads. Thermal energy storage reduces these peaks so the HVAC system can be smaller (right-sized) and more energy efficient. Building America has identified thermal energy storage systems as a top priority in achieving net zero energy buildings. The Policy Report should recognize the importance of thermal energy storage in reducing peak demand and achieving zero net energy buildings. Furthermore it should recommend incentive programs to maximize thermal energy storage and effective management, through controls, of the building's thermal energy mass.

Please contact me if you have any questions or concerns regarding these comments at [kdzienkowski@pvt solar.com](mailto:kdzienkowski@pvt solar.com) or at 510-809-3245.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'Karen Dzienkowski', with a stylized flourish at the end.

Karen Dzienkowski  
Director, Business Development and Advocacy