



California  
Business  
Properties  
Association

California Energy Commission

**DOCKETED**

**13-IEP-1F**

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In the matter of: )  
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2013 Integrated Energy Policy )  
Report (2013 IEPR) )  
Lead Commissioner Workshop )  
RE: **Zero Net Energy Definition** )

**Docket No. 13-IEP-1F**

California Energy Commission  
Dockets Office, MS-4  
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**Introduction:**

The California Building Industry Association (CBIA) and the California Business Properties Association (CBPA), hereafter referred to as “Industry”, welcome the opportunity to provide these comments to the California Energy Commission.

Industry would like to cautiously support the CEC’s effort to establish one or more definitions of “Zero Net Energy” for both commercial and residential buildings. We recognize the difficulty of such a project and the need to address a myriad of outstanding technical design, cost and political issues in order to get to some manner of usable definition that is understood by the general public and those who use, apply and interpret California’s building code.

As indicated at the July 18, 2013 Workshop, industry would like to raise a host of outstanding issues for the CEC’s consideration:

**The Definition of “Zero Net Energy”**

With regards to the inclusion of “societal value of energy” in the definition for “Zero Net Energy”:

Will all future changes to CEC’s building standards relative to energy efficiency and photovoltaic energy systems still meet the longstanding definition of “cost effective” wherein the up-front increases in cost borne by the homebuyer or building owner will be offset by reduced utility bills over the 30-year life of the building?

Simply put, will the homeowner get their money back? If not, how can industry be expected market this?

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**Liability for the builder and the building owner:**

Industry agrees with the CEC that there may well be the need for a variety of ZNE definitions, depending on the target audience.

It is one thing to have one or more definitions for ZNE for those involved in the development of regulations, building standards or utility programs. However, there is deep concern by industry that the use of the term in the public sector will be misunderstood; most notably the ZNE homebuyer is going to be VERY upset when the start receiving a monthly utility bill.

What will the CEC do to insure the public knows ZNE does not mean a \$0 utility bill?

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**Power Purchase Agreements (PPA’s):**

How will PPA’s be dealt with?

There are major pros and cons regarding PPA’s. On a positive note, the application of a PPA will result in a huge reduction in up-front cost to the consumer. On a negative note, a ZNE home that incorporates a PPA will still be getting a significant electric bill every month, albeit smaller than that of similar home without solar.

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### **Loading Order:**

A rigid interpretation of the loading order could become very problematic from both a design and cost perspective. Given the huge increases in stringency adopted into the standards over the past 12 years, getting that next increment of energy efficiency is going to be a lot tougher from a design, installation and cost perspective. As we approach the 2016 Update of the Building Energy Efficiency Standards, it is highly probable that the installation of some amount of solar may make more sense than the inclusion of one or more advanced building techniques that are not well understood or represent a major departure from common practice.

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### **Gas-powered appliances:**

How will “gas” usage be considered within a new definition/model of “zero net energy”? Some gas appliances will fit well into CEC’s TDV methodology (ie: gas dryer, gas stove). However, what about gas water heating (DHW and pool) and gas heating?

Will the ZNE definition inadvertently create an incentive to replace some gas appliances with electric? This will be of critical interest for those high-density, single-family home projects that are moving to two- and three-story design will increasing limited rooftop clear space for the application of solar. Application of highly efficient gas-powered appliances can significantly reduce the size of the rooftop PV system needed to offset the remaining electrical supply load of the home or commercial building.

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### **Planning and Land-Use Issues:**

How will ZNE impact planning and land use issues? High density, two- and three-story single-family homes are becoming the norm. This creates a significant physical constraint:

- Will there be adequate rooftop area for both PV and venting (and potentially solar water)?
  - Does ZNE apply to 100% of the **homes in the project or the project**? If it applies to each home, how do we deal with the 25%-40% that do not have proper solar alignment? Aligning residential streets for longer east-west stretches creates potential health and safety issues (car speed). **Will offsite PV be allowed?** If so, will the related PV system be allowed anywhere within the same CZ or restricted to adjacent property? Industry supports maximizing design flexibility. And with regards to commercial building design, it is hard to envision a ZNE building that is three or more stories in height that could reach ZNE without the ability to utilize off-site solar or other renewable energy sources.
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### **Building Standards Commission’s Nine Point Criteria:**

Signed into law by Governor Brown in 1978, SB 331 amended Health and Safety Code 18930 to require all building standards adopted or approved by the Building Standards Commission to meet a set of nine specific criteria. As such, there needs to be a level of clarity and precision in each and every building standard such that an architect can “design” and a building inspector can “inspect” the building **prior to occupancy**.

A few of these “Nine Point Criteria” pose significant challenges to the development and adoption of Zero Net Energy building standards.

For example, consider:

**Criteria #4:** *The proposed building standard is not unreasonable, arbitrary, unfair, or capricious, in whole or in part.*

**Criteria #6:** *The proposed building standard is not unnecessarily ambiguous or vague, in whole or in part.*

While these two criteria can (and do) allow for both prescriptive and performance-based building standards, a ZNE performance-based building standard must still be able to meet Criteria #4 and Criteria #6.

How will ZNE building standard account for the huge variation in plug load (55%) of the homes energy? Stated differently, two identical homes located immediately adjacent to each other could have vastly different monthly utility bills.

How does an architect effectively design to ZNE with no knowledge of who will be occupying the building? And how can the CEC establish a building standard that deals with this huge “post-occupancy” variation in a manner that will not be a violation of Criteria #4 and/or #6?

And once again, will “gas” appliances be treated fairly by the definition?

In another example, consider:

**Criteria #3:** *The public interest requires the adoption of the building standards.*

**Criteria #5:** *The cost to the public is reasonable, based on the overall benefit to be derived from the building standards.*

How will ZNE impact farm-worker housing, low- income housing and entry-level housing?

Will third-party PPA’s be considered acceptable for ZNE? Put differently, is the ZNE defined for the grid or the consumer? If a homeowner buys a ZNE home, will they still pay a bill? How much? Will they sue?

Should the word “Zero” be eliminated from this discussion?

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(continued)

The following comments were submitted by CBIA and CBPA relative to the CEC's Workshop on the "Cost Effectiveness of Rooftop Solar" via **Docket No. 07-SB-1** and are reprinted here due to their direct or indirect relevance to the establishment of one or more definitions of "Zero Net Energy".

**Net-Energy Metering Assumption:**

E3 assumes that net-metering will be available to any and all solar PV owners down the road, however; on Page 6, E3 clearly and correctly acknowledges the serious gravity of a non-fix to the NEM cap.

In addition, assuming that net-metering is available to all at some point in the near future, there will most certainly be some manner of monthly fee paid to the utility by solar users that allows the utility to recover reasonable costs associated with maintenance of the existing grid.

Politically, this is a significant issue that will be hotly debated at the Capitol in the coming year(s). In Industry's opinion, this places a significant "asterisk" on the CEC's cost-effectiveness conclusion.

The CEC, the CPUC, Industry, manufactures and the environmental community need to work with the utilities in making sure their issues are dealt with in a fair and responsible way. Simply stated: what are the appropriate cost-impact assumptions regarding a "reasonable monthly fee" being sought by the Investor Owned Utilities to cover transmission grid maintenance, etc.?

**Utility Line-Extension Costs:**

At the present time, builders must pay a line-extension "allowance" to the utilities during initial construction of a project. This allowance assures the ratepayers will be kept financially "whole" in the event the project is not completed or does not produce a revenue stream that allows the utility to recoup any and all related costs. Once the project (or home) is occupied, a revenue stream via monthly utility billings is created which allows the utility to reimburse the builder the "allowance" fees over a 5-10 year period of time.

Clearly, if a home has 4-5 kW of solar on the roof, the utility will see a significant reduction in the revenue stream compared to that associated with the traditional, non-solar home. As such, it is highly likely that the builder will very little, if any of the "allowance charges" repaid. This is a real and substantial up-front cost that is not accounted for in the CEC report. As the CEC moves forward with its goals for residential Zero-Net Energy by 2020, this is an issue that must be properly accounted for as part of the costs associated with solar installation.

**Using a "progress ratio" of 20% for the residential sector:**

The CEC analysis assumes a reduction of labor and installation costs (identified as a "progress ratio") of 20% for every doubling of solar installation on a global basis.

While there may well be some economies of cost reduction down the line as the volume of global application increases, there are a few issues of concern to industry:

First of all, **the costs at time of construction** are the costs that must be used in any cost-effectiveness analysis performed by the CEC. This has been the case over the many updates to the standards and should continue to be the case for solar in any future rulemakings. Obviously, in the event there is a decrease in the cost of solar (or any other measure in the regulations), subsequent updates to the standards should reflect the real-world change in installation costs of the individual measures.

Secondly, we are very concerned with a projected 20%-40% “reduction” of labor costs within the State of California, especially for the residential sector. The fact is labor costs were at a low point in recent years as a direct result of the collapse of the housing sector economy. Residential labor costs are already on the rise as the housing economy begins to improve. While it is possible that material costs and efficiencies may improve, it is highly doubtful that labor costs will take a dive in the near future, especially at a high rate of 20%-40%.

#### **System material cost data:**

The CEC contractor indicates they are using cost data recovered from the CEC’s New Solar Home Partnership program database. We fully appreciate the difficulty in obtaining high volume data on such an emerging industry, however, given the business models being used by many of the NSHP’s largest customers; it is highly likely that cost data recovered will be significantly lower than that experienced by that experienced by medium and small builders.

And there is also the high degree of uncertainty created by the growing influence by China on the overall global production of solar PV panels. In addition, there is also concern over the potential demand (and its related impact on costs) created by increasing installation of solar in other states and countries.

Observation: The residential building industry did not see the PV cost reductions from 2007-2011 as indicated in the CEC report. While we were supposed to see a 6-8% reduction per year for 7 years starting in 2006, we actually saw a 25% increase in PV costs in 2007-2008 due to world-wide shortage of processed silica and demand from Germany and Japan. That price leveled off for two more years and then began to drop in 2011. **The point industry wishes to convey is that the solar market (PV unit pricing) has been anything but predictable over the past decade.** The fact that things seem to be going well right now should not be the basis for assuming long-term, steady reductions in material pricing.

#### **“Market-Segmented Savings”**

With regards to the two methodologies considered within the report, the “market segmented savings” approach seems to be the easiest industry to understand and convey to the buyer. This is a critical point in that industry must be able to market the product. Regardless of whether an item is related to energy efficiency or energy production, industry must be able to show the buyer that *“It pays for itself in reduced utility billings”*. This is simple to understand and embrace from a consumer standpoint. Trying to explain the “average consumer savings” method or “time dependent valuation” to the average consumer will not be well received and will be very difficult to successfully market.

### **Smaller Issues/Questions:**

- **Size of the residential system used: 2.0kW – 3.5kW vs <10.0kW**  
The CEC report uses a system size of “less than 10kW for the residential sector. Is the entire range from 1kw to 10 kW cost effective for residential or was there a noticeable cut-off point? This is important as the average size of PV system being installed on residential dwellings is approximately 2.0kW.
- **Availability of NSHP Incentive:** The CEC rightfully assumes this program will be phased out (July 2016). However, the short-term availability of this program (present to 6/16) will have a significant and positive benefit on market transformation...providing the program is fully funded through 6/16. *The continued funding of this program through 6/16 is in jeopardy. While there has been recent success in retrieving funds that were borrowed by the Legislature (RRTF), all three IOUs are challenging the NSHP portion of the CEC's EPIC investment plan currently pending before the PUC. The combined \$50 million in EPIC funding for NSHP (2013-14) is not something that by any means is assured.* Is the CEC assuming the availability of a fully funded NSHP program through June 2016?
- **Gas usage:** What is the assumption of gas usage in the home? This has significant implications for the potential cost-effectiveness of “zero net energy”.
- **Local permitting/code differences:** Just like residential fire sprinklers, local “add-ons” and permitting/inspection issues are significant cost-impact problems for rooftop solar PV systems and cannot be ignored at the state level. Industry, manufacturers and the California Building Officials are all very interested in working with the CEC and OPR in addressing these issues.
- **2017 RES and use of PV as compliance option.** Considering that NSHP will be gone, this will provide a strong incentive keep the momentum going and is also attractive to small and medium size builders