

DOCKETED

Docket Number:	17-BSTD-01
Project Title:	2019 Building Energy Efficiency Standards PreRulemaking
TN #:	221073
Document Title:	2019 Residential Standards Residential Solar Photovoltaic, Storage, EDR and Grid Impacts
Description:	N/A
Filer:	System
Organization:	Robert Raymer
Submitter Role:	Public
Submission Date:	9/6/2017 5:19:55 PM
Docketed Date:	9/6/2017

Comment Received From: Robert Raymer

Submitted On: 9/6/2017

Docket Number: 17-BSTD-01

2019 Residential Standards: Residential Solar Photovoltaic, Storage, EDR and Grid Impacts

Additional submitted attachment is included below.



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September 5, 2017

To: California Energy Commission – Docket No. 17-BSTD-01

**Re: 2019 Residential Standards:
Residential Solar Photovoltaic, Storage, Energy Design Rating and Grid Impacts**

General Comments

The California Building Industry Association (CBIA) would like to extend our thanks to both Commissioner McAllister and to the CEC Staff for the inclusive process in the development of the 2019 Standards. There has been and continues to be a general desire to work with the interested parties and seek collaborative solutions to a host of issues.

This update is especially challenging as the building industry is trying to simultaneously learn how to implement the current 2016 Residential Building Energy Efficiency Standards (BEES) while recovering from the severe economic downturn and at the same time working with CEC staff and interested parties in the development of the 2019 Update to the same set of building standards. Both Standards represent large changes in established construction design practice and both represent historically large increases in initial construction costs.

And, to restate the obvious, we are attempting to implement all of this in a remarkably short period of time (3 years). CBIA's appreciates staff's patience as we move forward on the 2019 Standards.

Setting the Record Straight on Affordability Concern:

The point was recently made by CEC Staff that CBIA's concerns over the potential impact on housing affordability attributed to this update of the energy efficiency standards failed to recognize the economic benefit that a homeowner or renter of these newer dwellings will realize from the significant reduction in monthly utility billing costs. CBIA would like to clarify any misunderstanding and recognizes that the term "affordability" is hardly a universally understood or defined concept. CBIA agrees with CEC staff that a home built with very high levels of energy efficiency coupled with an on-site renewable energy component will almost certainly reduce monthly utility bills, thus providing the home owner with significant increased economic benefit.

To clarify, CBIA's concern with "affordability" relates to the ability of one to qualify for a home loan and ultimately purchase the highly efficient, solar-equipped dwelling. For example, if a first-time, entry-level home buyer is unable to qualify for the home loan, then that potential homebuyer will be unable to realize the financial benefits of living in that highly efficient, solar-equipped home. There is no question that the proposed cost of the 2019 proposed energy standards is historically large and seeks to implement a set of standards costing 3-4 times that of previous updates.

The point that CBIA is trying to make is that the proposed increased cost of \$13,000 for a new home in California's Central Valley will indeed make it harder for that first-time, entry-level home buyer to qualify for that loan. And in some cases, there will be prospective homebuyers who will not be able to meet the financial demands attributed to this additional \$13,000 of increased cost. It will be a policy decision left to the California Energy Commission and the California Building Standards Commission as to whether the overall environmental and greenhouse gas reduction benefits of these standards outweigh the initial economic hardship that these Standards may place on those seeking to qualify for a home loan.

California housing projections and when to expect significant increase in renewable energy:

At the present time, the California Homebuilding Foundation is projecting that California will produce a total of 120,000 units (single family + multifamily) in each of the years 2020 and 2021. California law requires a home to comply with the building standards which are in effect on the day the initial permit application is submitted to the building department. As such, it has been the practice over the past twenty years to see a gradual increase in permit applications in the last two quarters of the year preceding one or more major changes in California's building codes. As such, we can expect significant levels of compliance with the 2019 Residential BEES to start ramping up in mid-summer of 2020.

Currently, California homebuilders are placing solar on approximately 15,000 units per year. If we assume that all (100%) of the new dwelling units will be built with a solar component starting in July 2020, then we can expect to see roughly a seven-fold increase in the amount of installed rooftop solar in the 12-month period ending in July of 2021. However, it should be noted that this number could be significantly impacted by the application of several PV-component limitations or exceptions currently being developed by CEC staff to address numerous situations when solar installations would present a significant design hardship.

Specific Comments

CEC Proposal regarding energy storage, renewable energy and the EDR:

For the reasons stated below, CBIA strongly supports a robust compliance credit for energy storage technology for use in both the energy efficiency and renewable energy components of the energy design rating calculation. We urge the Commission to consider establishing a limited energy storage compliance credit in a manner similar to that associated with the Photovoltaic Compliance Credit (PVCC) currently offered in the 2016 Residential BEES.

In addition, and for the five reasons stated below, CBIA strongly supports significant compliance credit for use in both the energy efficiency and renewable energy components of the EDR for renewable energy for levels of PV which exceed the level required by the standards and when used in conjunction with energy storage:

- 1) The Building Industry needs to familiarize itself with energy storage tech.... NOW**
Similar to the PV compliance credit in the 2016 Residential BEES, the building industry needs to get very familiar with small-scale energy storage technology in a VERY short period of time. Unlike PV technology in 2014 (when we were developing the 2016 Update), the building industry is extremely unfamiliar with energy storage at the present time. And unlike PV installations, federal and state incentives for residential energy storage application

are largely non-existent at the present time. A legislative effort to rectify this (SB 700) has stalled and cannot be taken up again until the 2018 CA legislative session begins. Even then, there will be significant political and policy hurdles which must be addressed if such a state incentive program has any hope of being established.

At the present time, the most promising opportunity to promote rapid acceptance of energy storage technology will be through the establishment of substantial compliance credit in a manner similar to that of the 2016 PV compliance credit. In addition to providing offset in the PV component of the EDR, the building industry would strongly suggest the CEC to consider establishing a limited energy storage compliance credit that could be used to forgo installation of the additional energy efficiency measures being sought in the 2019 update of the Residential BEES (i.e.: the 2019 HPA and HPW improvements beyond the 2016 levels, QII, windows, etc.). The result of this limited credit may be a 2016 compliant house with a modest sized PV system and storage that is grid harmonized.

2) Grid harmonization and distribution system impact mitigation

Over the past nine months, the CEC Staff presentations have been placing an increasing emphasis on the rather “ominous” need for future updates of the standards (starting with 2019) to address grid harmonization issues. Also, behind the meter batteries will help mitigate the impact of the new PV systems on the local utility distribution system and transformers. The building industry fully agrees with the CEC staff on this observation. Residential roof-top solar units will produce the lion-share of its daily power production during the hours of 10am-3pm, a time when anticipated home energy load will be small and the potential exists for sending unused power production out into the local utility grid...at a time of day when it’s not needed and cannot be stored. This can and probably will prove problematic for grid operators during the mid-day hours of spring and fall. Finding a way to keep this excess power on-site for later use during the peak-load hours of the day will prove immensely beneficial for grid harmonization and greenhouse gas reduction. A robust compliance credit for energy storage will play a critical role in achieving that goal.

3) Time-of-use-rates and consumer benefit

California utility rate payers will be making the shift to time-of-use rates within the next 2½ years. Starting in 2020, new homes will be sending excess “low cost” electricity into the grid during the middle of the day and then paying the utility for high-cost electricity during peak load hours in the late-afternoon and early-evening. It is highly probable that many utility ratepayers, including those with rooftop solar, will experience a monthly billing “shock” when they start receiving their monthly utility bill during the hot summer months. It would be very beneficial for the consumer to be able to save that low-cost electricity on-site for use when the highest utility rates kick in during the hours of 4pm-8pm. On-site energy storage will help tackle this problem head on and will provide the builder with a highly marketable tool for use in selling the home. In terms of “operational affordability”, on-site energy storage (and on-site energy storage used in conjunction with addition PV beyond that required by the CEC) has the greatest potential for reducing that monthly utility bill. In addition, increased installation of energy storage systems will help reduce compliance costs in the same manner that the cost of rooftop solar PV systems decreased with increased market saturation.

4) **TDV basis of the standards**

Today's energy storage technology is advancing rapidly and the related costs are dropping. Since storage technology allows for the gathering of low cost PV energy around the middle of the day and keeps it on-site for use during peak load periods in the late-afternoon and early-evening, from an EDR/TDV perspective, this has the same (or significantly better) impact on home energy use as a highly efficient air conditioning system. In short, CBIA believes that energy storage (and on-site energy storage used in conjunction with addition PV beyond that required by the CEC) should be modeled like an extremely efficient appliance, as the impact of PV plus batteries on energy usage is virtually indistinguishable from energy efficiency measures. After all, the CEC's "time dependent valuation" based regulations are now designed to give greater levels of compliance credit to those measures which reduce peak load power demand. What better way to reduce peak load power demand than have something on-site (i.e.: storage plus solar) which slashes (or eliminates) a home's power demand on the grid during peak hours.

5) **Builders need more compliance options**

Over the past several Title 24, Part 6 updates, many of the compliance options that builders have relied upon for compliance have become prescriptive measures and therefore are not accessible anymore including tankless water heaters, efficient window systems and QII. Additionally, many production builders use the 4-orientation compliance approach where the worst orientation (the one with the most glazing) will be facing west. Without additional compliance options, such as this storage credit, the 4-orientation compliance approach may become very difficult or even impossible.

Off-Site and Community Solar Options:

In general, the building industry will be very supportive of off-site solar installation options which can either be used to supplement or replace on-site solar installations. For example, some developers may have access to thousands (and even millions) of square feet of vacant area on rooftops of commercial buildings and/or additional land holdings upon which residential dwellings cannot be built but where a solar "farm" may be feasible. It may also be found that a community scaled solar installation that either augments or replaces the on-site solar is cheaper to install. And while the local entitlement process can be lengthy, involving local city, county and regional governments and utilities (IOUs and munis), the CEC's 2019 Update should include a variety of off-site and community-based solar placement options to allow production builders a maximum amount of design flexibility in meeting the CEC goals in the coming years.

For example, SB 1 (2006) directed the CEC to develop a "solar offset" program wherein a developer could forgo offering solar as a design option on the project if they actually installed solar somewhere else within the same climate zone and utility service area. However, we also agree with the staff presentation that there can be some challenges in the establishment of an offset program designed to work in concert with the 2019 BEES renewable energy requirements. The building industry looks forward to working with staff and interested parties to resolve these challenges with the understanding that the great array of compliance options made available to industry in 2020 will serve to promote a smoother transition to what can be described as the single greatest change ever proposed for California's building standards.

Energy storage: The need for the standards to recognize a range of device capabilities

CBIA was pleased to hear that staff intends to include compliance credit for more than just the “basic” and “smart” battery technologies. Small scale energy storage is a rapidly evolving technology and we heard numerous sources at the August 22nd workshop indicate that there already exists technology that allows the homeowner to program the on-site system and achieve almost all the benefit that was previously attributed to the “smart” batteries that are controlled by the local utility.

As stated by representatives from solar and storage industries, given the pending switch to time-of-use rates, homeowners will be economically encouraged to store PV-generated energy for onsite use during high cost, high carbon hours in the evening, thus reducing the on-site exports during the low-load hours which drive serious grid distribution and integration issues. This will be a highly marketable feature to consumers once TOU rates have been fully implemented.

Regarding the administrative process:

It would be good for the CEC in the coming weeks to clarify what aspects of solar and energy storage will be addressed as part of the Part 6 Update and what aspects will be addressed as part of the ACM development and adoption process (presumably taking place June-November 2018).

For example:

When it is determined that on-site renewables are not feasible for a specific site, will the exceptions and alternate paths for compliance be developed as part of the ACM, Part 6 or both? *At the present time, it is the view of CBIA that it may be necessary for this to be part of both documents.*

High Performance Attic and High Performance Wall Cost-Effectiveness Concerns

Due in part to the sporadic uptake of HPA and HPW, the incremental costs currently being incurred by builders to comply with the 2016 prescriptive requirements are much higher than the CEC predicted they would be when analyzing the cost-effectiveness of the 2016 Standards. Based on incremental cost data provided to CBIA by builders currently installing HPA and HPW in California, they are incurring costs two to three times higher than predicted by the CEC CASE authors for HPA and three to five times higher for HPW. As more builders integrate these measures and alternate ways to comply with HPA requirements are found, the cost to install HPA should stabilize. However, the cost to install HPW is not likely to go down and CBIA will not have that data until late-2017 or early-2018 when the 2019 Standards adoption will be in 45-day language.

Some areas of California have not fully recovered from the economic downturn and will therefore have more difficulty absorbing the increased costs of the proposed 2019 measures, especially the significant decrease in the prescriptively required U-value for walls from 0.051 to 0.043 when they are still having difficulty meeting the 2016 requirement for 0.051 walls cost-effectively.

Due to these difficulties, the industry needs a prescriptive solution that will allow builders to continue to use 2x4 framing. Using R-15 batts with an R-7.5 XPS exterior, a U-value of 0.051 can be achieved with 2x4 framing; **therefore, CBIA recommends that the prescriptive requirement remain at 0.051 for the 2019 standards.**