California Building Industry Association

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In the matter of:)	**DOCKET No. 14-BSTD-01**
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2016 Building Energy Efficiency)	Dockets Office, MS-4
Standards (Part 6) Update)	1516 Ninth Street
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Introduction:

The California Building Industry Association (CBIA) is a statewide trade association representing over 3,000 member-companies involved in residential and light commercial construction. CBIA member-companies are responsible for over 90% of the new production-style homes built in California each year.

General Comments:

The California Energy Commission's 2013 update of the Building Energy Efficiency Standards (BEES) accounted for the single greatest increase in stringency (27%) since the beginning of the California energy code dating back to 1978. The proposed 2016 Standards are following with a similar increase in stringency resulting from significant proposed changes in roof and wall construction design.

During the past 25 years, the residential construction industry has been resistant to rapid change due to the significant financial risk from construction defect liability. The measures proposed for the 2016 BEES will require significant changes to attic and wall construction that could increase our industry's exposure to this type of risk. CBIA expresses strong reservations to any changes in construction practice that are not market proven, accepted in the building code and make use of readily available products that have been vetted for their intended use by the building and inspection trades.

CBIA has conducted a thorough review of costs for the proposed changes to the Standards and has found that they will **exceed $5,000**. This is roughly twice the cost estimates provided in the final CASE reports. CBIA believes there are modifications to the CEC's proposals and possible modifications to the building code that can reduce this unacceptably high incremental cost.

The rising cost of regulation is making homes unaffordable. NAHB's State and Metro House Price Study[1] released August 1, 2014 estimates that each $1,000 of incremental cost to new housing prices over 14,400 California families out of the new home market. Pushing these consumers out of the new home market puts them in the market for rental or existing housing, raising resale and rental prices and reducing overall housing affordability. **And it goes without saying that the CEC's 2016 proposed set of energy efficiency changes will have a far greater (and negative) impact on small- and medium-size construction companies.**

A primary goal of California Long-Term Energy Efficiency Strategic Plan is to reduce greenhouse gas through energy efficiency. The greatest opportunity to reduce energy consumption in housing is to improve the energy efficiency of existing housing. A California Homebuilding Foundation study in 2008[2] demonstrated it was five to eight times more cost effective to reduce energy consumption in existing homes than new homes. There are over 13 million existing homes in California; the majority of which were built prior to the 1980s (before any energy code). During the five-year period since the passage of AB 758 in 2009, the State has spent a small fraction of the effort on improving the efficiency of existing homes, as compared to new construction. CBIA supports efforts to cost-effectively improve energy efficiency in California's housing and emphasizes that the CEC to should focus their efforts on the existing housing stock where significant energy reduction can occur.

Over the past nine changes to the energy code, improvements to building envelopes, mechanical equipment and water heating equipment have provided ever diminishing returns, and we are now at the point when we must look elsewhere for energy savings. Over half of the energy consumption in new homes is unregulated loads. As the 2016 Standards are developed, CBIA has been working with the CEC staff to develop a variable

[1] Housing Economics.com; State and Metro Area Prices: the "Priced Out" Effect; Natalia Siniavskaia, August 1, 2014

[2] Meeting AB 32 – Cost Effective Green House Gas Reductions in the Residential Sector, August 2008, California Homebuilding Foundation

credit for photovoltaic (PV) systems. For simplicity in implementation, and in preparation for zero-net energy design, **CBIA feels this variable credit should be allowed against the total energy budget**. CBIA agrees that there should be a minimum envelope standard (e.g., 2013 mandatory requirements), after which any trade-off should be allowed. This will result in further encouraging PV in new construction. To that end, **CBIA strongly urges the CEC to consider the inclusion of a prescriptive "PV Package" for each of the 16 Climate Zones as part of the Part 6 Update**. With the historically downward slope of the PV cost-curve now flattening and the NSHP buy-down terminating as early as the fall of 2015, a variable PV credit would allow the continued growth of PV in new construction and assist in the march toward the State's zero net energy homes goal.

Residential Building Energy Efficiency Standards (Title 24, Part 6): Technical Comments:

The following are CBIA's Technical Comments to the Four Basic Proposals (Attics, Walls, Water Heating and Lighting)

High Performance Attics

CBIA agrees that reducing attic temperatures in summer is crucial to improving the cooling energy performance of the home. However, the options proposed for insulating above or below the roof deck are either not cost effective, an unproven change in building practice, or not allowed by code.

Using draped netting below the roof deck filled with fiberglass or cellulose (in a vented attic configuration) is highlighted by the CEC C&S team as a prescriptive option for meeting the proposed code. This method is largely untested in California climates and therefore presents a risk to California production builders. In many climate zones there would also be an increase in the minimum ceiling insulation from R30 to R38. CBIA has looked carefully at the cost of these proposed changes, and found that builders will have to spend an additional $3000 to construct a high performance attic in a typical home. This cost alone exceeds the total cost for all new 2016 measures, as estimated by CEC consultants.

Insulating above the roof deck with rigid foam insulation requires an additional layer of OSB to provide roofing product a solid nailing substrate. This additional OSB adds to the total weight of the roof, which can increase the cost of framing and trusses to support the roof. The distance between the nailing layer of OSB and the roof trusses it is fastened to create a concern that steep-pitched roofs with heavy tile could slide over time. The cost just for above-roof-deck rigid insulation and adding a layer of OSB for nailing of roofing tiles or shingles is close to $3000. Builders could insulate below the roof deck with rigid foam insulation; however, the cost for the labor to cut and adhere the insulation to the underside of the roof deck makes this option cost-prohibitive.

Spray foam is an alternative to insulate under the roof deck. However, the cost to add the minimum R-30 or R-38 under roof deck spray foam insulation is two and one-half times the expense of traditional means of insulation.

Other options to reduce the temperature that the HVAC system is exposed to, such as ducts in condition space, are not acceptable to the buying public. CBIA will work with CEC staff to find alternate, cost effective options to reduce attic temperatures.

High Performance Walls

The CEC staff proposal of a 0.05 U-Factor wall will require significant changes to standard wall construction and/or framing techniques. The most active source of construction defect litigation is water penetration through walls. The building industry, stucco contractors and window manufacturers and installers have significantly improved installation practices over the last decade, and litigation from water intrusion has greatly diminished. In order to produce a wall with a 0.05 U-factor, builders will either need to use 2x6 construction with R19 cavity insulation and R6 foam sheathing, or R15 cavity insulation with R8 foam (if they wish to continue using 2x4 framing).

Transitioning to 2x6 construction would require builders to change a number of practices and would add to both material and labor costs. Alternately, retaining 2x4 framing would require the use of R8 foam sheathing, which is between 1.5 and 2 inches thick. Adding this extra thickness changes the way windows are attached and sealed to walls. Altering the window frame to accept two-inch exterior foam sheathing changes the center of gravity which puts stress on the window at installation. Window manufacturers have begun developing and publicizing techniques for supporting windows installed with thick foam sheathing, but until these methods are proven in the field deviating from current practice presents a risk.

Another problem from increasing exterior foam sheathing to two inches is the increase in the width of new homes. Currently most lots are built on 35 feet, 40 feet and 45 feet lot widths. Increasing the width of the house by two inches will cause the existing subdivision maps and/or the home construction plans to be redrawn to accommodate the larger width of homes.

The other exterior foam sheathing alternative is to use one-inch R-8 foam sheathing. R-8 foam sheathing of this dimension does not exist in the market today and according to most high density foam sheathing manufacturers cannot be made. It is problematic to suggest code changes that rely on products that do not exist in the market.

One-inch exterior foam sheathing made from polyisocyanurate achieves an R-6 rating. Polyisocyanurates are faced and need to be protected from stucco. Adding a layer of building paper to the exterior of the foam sheathing, or moving the building paper to the exterior of the wall assembly prior to stucco application may allow for the use of R-6 one-inch foam. Either is a change in construction practice for sealing walls for water intrusion and needs to be vetted by the industry.

CBIA looks forward to discussing these concerns with staff and developing a strategy that improves wall insulation without creating significant cost increases or exposure to water intrusion and construction defect liability.

High Efficiency Water Heaters (minimum Energy Factor of 0.82)

Tankless water heaters are commonly installed in production housing. CBIA is concerned whether or not an Energy Factor of 0.82 violates the Federal preemption for storage water heaters. The NAECA Standards specifies a 0.62 EF for storage water heaters effective in 2015. In addition, CBIA has concerns that requiring additional measures (QII and pipe insulation) when a storage gas water heater is used may end up being found in violation of Federal Preemption as well. Lastly, CBIA is exploring if a single tankless water heater can service a typical home without homeowner complaints.

Lighting

The proposal to move towards Edison-based high-efficacy (LED) lighting is positive. CEC staff and consultants have addressed concerns about efficacy, color quality, dimability, flicker and longevity by proposing strong quality and performance standards in Joint Appendix 8 (JA-8). CBIA now understands that the potential for light-quality degradation related to heat in recessed cans is the primary rationale for prohibiting Edison-based fixtures in those applications. Although cost is still a concern, recent price reductions for quick-connect LED downlight products have minimized the cost difference between these fixtures and Edison-based LED bulbs for recessed applications.

Conclusion:

CBIA's comments are meant to be part of the constructive dialog in formulating the 2016 Standards. CBIA looks forward to working with staff to resolve outstanding issues and move towards a rapid adoption of the 2016 Standards.

Along those lines and similar to the cooperative efforts between CBIA and Energy Commission staff during the development of the 2013 Update, CBIA looks forward to working with staff in comparing our estimated cost of compliance with those produced by the energy commission for similar types of buildings.