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*Comment Received From: Lucas Morton/ CABEC Advocacy Committee
Submitted On: 6/21/2021
Docket Number: 21-BSTD-01*

Comments on 45-day 2022 Express Terms

Additional submitted attachment is included below.



6965 El Camino Real, Ste 105-124
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February 4, 2021
California Energy Commission
Docket Office, MS-4
Re: Docket No. 19-BSTD-03
1516 Ninth Street
Sacramento, CA 95814
docket@energy.ca.gov

RE: Title 24-2022 45 day Express Terms

To Whom It May Concern:

The California Association of Building Energy Consultants (CABEC) is the leading association of practicing energy consultants within the state. CABEC members serve as key partners for homeowners, builders, and contractors in administration, education, and enforcement of the Energy Standards. We are pleased to have an opportunity to comment on the 45-day language of the Energy Code, and we hope that we will offer useful insight and feedback on the substantial changes offered in this upcoming code cycle.

Our comments will be appended in the following pages in table form with the intent of improving readability (apologies in advance if this attempt at readability is less than successful).

Sincerely,

A handwritten signature in black ink that reads 'Lucas Morton'. The signature is written in a cursive, flowing style.

Lucas Morton, on behalf of the
CABEC Advocacy Committee

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|--------------|--|------------------------------------|--|
| 1 | §100.1 | DEFINITIONS | DWELLING UNIT, JUNIOR ACCESSORY | <i>DWELLING UNIT, JUNIOR ACCESSORY, or JADU is a dwelling unit that is no more than 500 square feet in size and contained entirely within an existing single family building.</i> |
| | Comment | <p>This definition conflicts with HCD definitions and many local designations. There is nothing generally to say that a JADU is created and contained entirely within an existing single-family building.</p> <p>We recommend that you match the current HCD definition of JADU. According to HCD website: https://www.hcd.ca.gov/policy-research/accessorydwellingunits.shtml#newlaws</p> <p>"Junior Accessory Dwelling Units (JADUs) are allowed to be created within the walls of a proposed or existing single-family residence and shall contain no more than 500 square feet.</p> <p>Also see Gov. Code, § 65852.2</p> | | |
| 2 | §100.1 | DEFINITIONS | SINGLE FAMILY RESIDENCE | <p><i>SINGLE FAMILY RESIDENCE BUILDING is any of the following:</i></p> <ul style="list-style-type: none"> <i>o A residential building of Occupancy Group R-3 with two or less dwelling units,</i> <i>o A building of Occupancy Group R-3, other than a multifamily building or hotel/motel building,</i> <i>o A townhouse,</i> <i>o A building of Occupancy Group R-3.1, or</i> <i>o A building of Occupancy Group U when located on a residential site.</i> |
| | Comment | <p>Clarify distinction between R-3 with two or less and the general R-3 other than multifamily or hotel/motel. It seems the second definition eats the first.</p> <p>Also, clarify what you mean by 'residential site' for Occupancy Group U. Does this mean that a Group U building on a high-rise residential site is a now considered a single-family residence building?</p> <p>Also-- consider the received grammar rule and change 'two or less' to 'two or fewer' as dwelling units are a discrete counted quantity.</p> | | |
| 3 | 10-111(a)1.B | CERTIFICATION AND LABELING OF FENESTRATION PRODUCT AND EXTERIOR DOOR U-FACTORS, SOLAR HEAT GAIN COEFFICIENTS, VISIBLE TRANSMITTANCE AND AIR LEAKAGE | NFRC 100 and 200 | |
| | Comment | <p>We encourage the Commission to consider expanding this include thermal performance of glazing using international standards: ISO 10077, CEN - EN 673, and DIN EN ISO 12631. There are many high performance glazing systems (typically European) that have excellent thermal performance and would greatly benefit the efficiency of buildings, but do not have the wherewithal or desire to invest in NFRC testing. It is a shame to discourage projects from using these high performance products in favor of lower performance with requisite NFRC 100 and 200 performance data.</p> | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|------------|--|--|---|
| 4 | 10-115(a) | COMMUNITY SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ON-SITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS | Community Shared Solar Electric Generation System or Battery Storage System Offset | <i>...may be used as a compliance option to partially or totally meet the on-site solar electric generation system and/or battery storage system that is otherwise required by Section 140.1(b), 150.1(b)1, or 170.1(b) of Title 24, California Code of Regulations, Part 6...</i> [emphasis added] |
| | Comment | The language states that Community Solar only applies to the Performance path. Is the intent to really exclude Prescriptive compliance here? I don't see a reason why Community Solar could not reasonably meet the PV requirements that are indicated in the Prescriptive pathway. | | |
| 5 | 10-115(a)3 | ibid | Participating Building Energy Savings Benefits | <i>is otherwise required by Section 150.1 of Title 24. The energy savings benefits allocated to the building shall be in the form of:</i> |
| | Comment | Update the code references to include non-res and multifamily | | |
| 6 | 100.1 | DEFINITIONS | Heat Pump | |
| | Comment | "Heat Pump" and "Heat Pump Water Heater" are defined, but are defined to exclude a number of other purposes and capabilities. Given the importance of heat pump technology in future code cycles, we believe it's important to invest in a more thorough ontology of heat pump technology. For example-- heat pump could be defined as a machine with general reversible refrigeration cycle (vapor compression, ad/absorption, etc.), with subclasses of 'air-to-air heat pump', 'air-to-water heat pump', 'heat pump water heater', etc. | | |
| 7 | 100.1 | DEFINITIONS | DUCTED and NONDUCTED SYSTEMS | |
| | Comment | The definition provided is arbitrarily constrained to air conditioning and heat pumps. To wit--there are also ducted furnaces, and nonducted floor heaters, wall furnaces, and baseboard electric heaters. For non-ducted heat pumps, the term 'nonducted' is not in common use for this kind of system anyway, rather the term 'ductless' is used in the industry and in the ACM/software. Consider refining the definitions to capture more common sense use, and also adding 'ductless' as a defined term. | | |
| 8 | 110.8(d)1 | MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS | Installation of installation in Existing Buildings | |
| | Comment | The Exception is specifically edited to only apply to single-family homes. However, don't the attic ventilation requirements from CRC 806 and CBC 1202.2 also apply to all low-rise buildings? This exception is important as it allows contractors to add insulation into uninsulated and poorly insulation buildings with minimal attic and rafter depth while maintaining venting. Without this exception, contractors may be incentivized to not add any insulation, thus squandering a substantial efficiency opportunity. We suggest that you maintain the applicability to 'low-rise residential' and not just 'single-family' | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|---------------|--|-----------------------------------|-------------------------|
| 9 | 140.3(a)9A | PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES | AIR BARRIER | |
| | Comment | Code now requires construction documents include "air barrier boundaries, interconnections and penetrations, and associated square foot calculations for all sides of the air barrier." We believe this is a good and helpful requirement and we encourage the Compliance Manual and Education team to provide examples to educate plans examiners and design professionals alike in how to satisfy this requirement. | | |
| 10 | 150.0(a)1 | Ceiling and Rafter Roof Insulation | attic and rafter insulation | |
| | Comment | We suggest that you broaden exception to include other duct locations than just the conditioned space. E.G. if ducts and AHU are in crawlspace, we question the cost-effectiveness of HPA insulation. Consider revising to "No roof deck insulation is required when there are no ducts or air handler in the attic. | | |
| 11 | 150.0(k)1C | EXCEPTION to Section 150.0(k)1Cii and iii: | | |
| | Comment | Thank you. This is a welcome exception. | | |
| 12 | 150.0(k)2Ei | Automatic Off Controls | | |
| | Comment | Please define walk-in closets. Or is this a Potter Stewart test (i.e. you know it when you see it)? | | |
| 13 | 150.0(k)5 | Residential Garages for Eight or More Vehicles | | |
| | Comment | This element seems a remnant of Multifamily. The nonresidential lighting requirements are more appropriate for garages that are shared among multiple tenants and/or dwelling units, and seem inappropriate for single-family residences with generally 3 or fewer dwelling units. Consider removing this. | | |
| 14 | 150.0(m)12Aii | Air filtration | | |
| | Comment | Air filtration applies to both mechanical supply-only and makeup air systems. However, makeup air systems are not necessarily mechanically driven (as indicated in Section 100.1 definitions)-- some systems are simply passive barometric relief. In the context of this requirement, filtration seems intended for mechanically driven makeup air, and we encourage this qualification be added. | | |
| 15 | 10-115(a)4 | Durability and Building Opt-out | | |
| | Comment | "...if and only if..." This phrase seems out of place in code language as the biconditionality has no apparent meaning when there is only one articulated qualifying condition. To wit-- the 'only if' goes without saying. | | |
| 16 | 150.0(c)5 | Wall Insulation | Mandatory Masonry Wall insulation | |
| | Comment | The mandatory requirements incorporate the Prescriptive requirements by reference-- this is weird. Furthermore, why are masonry walls required to have greater insulation than light-framed metal/wood walls (in the case of interior insulation)? One would think that higher thermal capacitance in a masonry wall would benefit efficiency relative to a framed wall with equal thermal resistance. The exterior insulation approach does allow for a lower/lesser mandatory insulation, but then this typically requires significant extra costs in insulation attachment and cladding. It just seems arbitrarily punitive on masonry walls. | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|----------------------|--|---------------------------|---|
| 17 | 150.0(o)1Gv.a | Airflow Measurement of Local Mechanical Exhaust by The System Installer | | |
| | Comment | The CF2R's have not yet been issued or updated for this code cycle, but we hope that CF2R's, Reference Appendices, RCM, and supplemental trainings will help bring this ambitious requirement to greater success. | | |
| 18 | 150.0(o)1H | Airflow Measurement of Whole-Dwelling Unit Ventilation | | <i>Balanced mechanical ventilation system airflow shall be the average of the supply fan and exhaust fan flows.</i> |
| | Comment | As we understand this-- if the supply air is 200 CFM and the exhaust air is 220 CFM, then the unit is only getting 210 CFM of ventilation air? There seems to a mass imbalance here, and it is not immediately apparent why the total ventilation rate shouldn't be the greater of the two values for the purposes of satisfying total airflow requirements as this would reflect reality. | | |
| 19 | 150.0(o)2A | Whole-Dwelling Unit Ventilation Airflow Performance | | <i>Balanced mechanical ventilation system airflow shall be the average of the supply fan and exhaust fan flows.</i> |
| | Comment | Same comment as before | | |
| 20 | 150.1(c)1A NOTE | Roof and Ceiling insulation requirements | | <i>NOTE: Low rise residential single- family and multifamily buildings with the ducts and air handler located in the conditioned space, as specified by Section 150.1(c)9B, need only comply with insulation requirements of Option C</i> |
| | Comment | Remove reference to Multifamily buildings in the NOTE | | |
| 21 | 150.1(c)1C Exception | Raised Floor insulation | | |
| | Comment | We suggest that you add a reference to R408 and R408.2 Exception | | |
| 22 | 150.2(b)1Dii | Altered Duct Systems - Duct Sealing | | <i>If the air handler and ducts are located within a vented attic the requirements of Section 150.2(b)1J shall also be met</i> |
| | Comment | We are ambivalent about this addition. On the good side, In spite of some obvious pitfalls in compliance and enforcement, we support this section as a beneficial policy ratchet for project types that are difficult to incentivize efficiency. On the downside, this will frustrate many and incentivize non-permitted work. | | |
| 23 | 150.0(s)2 | Energy Storage Systems (ESS) Ready | | <i>"A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard suitable to be supplied by the ESS..."</i> |
| | Comment | Consider saying "co-located" instead of "collocated". We believe that's what was intended and the hyphenation will read better. | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|--|---|---------------------------|--|
| 24 | 150.1(c) and EXCEPTION 6 to Section 150.2(a) | Ventilation Cooling Exemption | | <i>Additions 1,000 square feet or less are exempt from the Ventilation Cooling requirements of Section 150.1(c)12</i> |
| | Comment | This exemption should apply to new construction as well as additions. Typical ventilation cooling fans are too large to fit into typical attic spaces in smaller building geometries. | | |
| 25 | 150.1(c) and 150.2(a)1Aii | Glazing Area allowances | | <i>The maximum allowed fenestration area shall be the greater of 175 square feet or 20 percent of the addition floor area, and the maximum allowed west-facing fenestration area shall be the greater of 70 square feet or the requirements of Section 150.1(c).</i> |
| | Comment | Minimum baseline allowances for glazing (175 sq.ft.) and West-facing glazing should be extended to new construction | | |
| 26 | 150.1(c) and 150.2(a)1B | Ceiling and Attic requirements | | <i>Additions that are 700 square feet or less shall meet the requirements of Section 150.1(c), with the following modifications:</i> |
| | Comment | Allowances for non-HPA, requirement of radiant barrier, and minimum allowances for Total and West-facing glazing (120 and 60 sq.ft., respectively) should be extended to new construction less than 700 sq.ft. and greater than 400 sq.ft. The same difficulties in applying roofline insulation while maintaining proper attic venting, HVAC unit access (per CBC and CRC) and running ductwork apply. | | |
| 27 | 150.2(a)1Cia2 | Whole Dwelling unit ventilation | | <i>Junior Accessory Dwelling Units (JADU) that are additions to an existing building.</i> |
| | Comment | The existing language is consistent, but you may consider adding clarifying language-- "JADU's that are or include additions to an existing building. Also-- pertinent to previous comment on the definitions in Section 100.1, the implied definition here is one that is partially precluded by the definition in section 100.1. I would reference our previous comment on that to make the definitions cleaner and more consistent. E.G. in spite of definition of JADU in section 100.1, a JADU may or may not be an addition (it could be entirely new construction), and if is an addition, then it may also include new construction elements and not include conditioning previous enclosed space. | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|--------------------|---|--|---|
| 28 | 150.0(m)1Bii a & b | Air-Distribution and Ventilation System Ducts, Plenums, and Fans | Insulation requirements for ducts in conditioned space | |
| | Comment | <p>According to the referenced documents analyzing ducts in the conditioned space, the intention of this requirement appears to be condensation control, and the authors of the study did not conclude that condensation was a particularly large issue in California. From the report: "Based on the analyses performed the authors conclude that condensation of water on duct surfaces is not likely to be a major issue for uninsulated ducts located in wall cavities in California homes." Indeed, the amount of condensation was calculated to be less than a teaspoon.</p> <p>The inclusion of duct insulation for ducts in conditioned space is largely indicated in best practice design, but the supporting study offers weak support for a code requirement. Furthermore, the code language itself is a bit overwrought given the realities of available materials (see next comment). Condensation control on duct systems is already covered in the mechanical code and would encourage that such language be placed there. Condensation control strategies run counter to energy efficiency in some cases, as is apparent with the counterintuitive requirement for lower insulation on higher emissivity surfaces (e.g. in a chapter of code that is generally about energy efficiency, wouldn't we expect more insulation on high emissivity surfaces?)</p> <p>As a parting thought, we acknowledge that these comments may be overwrought, as we believe that most field practice will defer to the Exceptions provided, and the code requirement is indeed helpful in motivating that practice. Furthermore, we believe that this will have at least benign, and maybe even positive impacts on HVAC distribution system efficiency and performance.</p> | | |
| 29 | 150.0(m)1Bii a & b | Air-Distribution and Ventilation System Ducts, Plenums, and Fans | Insulation requirements for ducts in conditioned space | |
| | Comment | <p>Using an emissivity value to trigger meeting a or b is going to be difficult. Based on 45-day express terms hearings, ducts with a surface emissivity greater than or equal to 0.8 were referred to as sheet metal ducting. Unfortunately, emissivity ratings for this type of material is uncommon and may cause confusion for installers and inspectors. I suggest adding language to identify the intended material for ducting for a & b.</p> | | |
| 30 | 150.2(a)1Ai | Prescriptive Additions | | <i>Extensions of existing wood-framed walls may retain the dimensions of the existing walls and shall install cavity insulation of R-15 in a 2x4 framing and R-21 in a 2x6 framing.</i> |
| | Comment | <p>This allowance for wall extensions should also apply to Alterations --150.2(b). Consider the case of not just an addition, but also a 'subtraction' of conditioned space where newly constructed walls are being built in the same plane as an existing wall. We believe It is reasonable that this same exception apply here for newly built walls in existing spaces, but there is currently no allowance for it in the code.</p> | | |

| Comment # | Section | Section Title | Subsection or Description | Referenced/Changed Text |
|-----------|-------------------------------|---|---------------------------|--|
| 31 | 150.2(b)1G | | | <i>Altered or Replacement space-heating systems shall comply with Section 150.1(c)6.</i> |
| | Comment | <p>If I'm following this correctly, then a furnace that breaks down in Santa Rosa can be replaced with a new furnace, but if it breaks in San Francisco, then there is no Prescriptive compliance option to replace that unit. More generally, prescriptive replacement space heating systems in CZ's 3,4,10,13,14 must be heat pumps. While this requirement may be facially appealing to decarbonization advocacy, it may ultimately prove to be counterproductive as this will be a significant disincentive to pull a permit.</p> <p>During the hearings, CEC Staff mentioned that replacement equipment could be of the same fuel type, but this is not consistent with the language. We note that the language in section 150.2(b)1H for Prescriptive Water heating alterations/replacements is fuel neutral.</p> | | |
| 32 | 160.1(b) | Wall insulation requirements | Categorical confusion | |
| | Comment | <p>Mandatory requirements in subsection (b) describe insulation requirements for all walls separating conditioned space and unconditioned space or ambient. Then subsection 7 includes more specific requirements for demising walls. We would encourage restructuring so the code and more stringent requirements for demising walls in those subcategories are included in the assembly categories. Specifically-- we encourage you to include a demising wall category under wood-framed walls instead of describing demising walls in the same ontological level as wood-framed walls.</p> | | |
| 33 | 160.1(c) | EXCEPTION to Section 160.1(c) | | |
| | Comment | Please cross-reference CRC and CBC sections pertinent to this section. | | |
| 34 | 150.0(o)1Kii and 160.2(b)2Axb | | | <i>Atmospherically vented or solid fuel burning appliances shall not be installed inside the pressure boundary in dwelling units with conditioned floor area less than 1,000 ft.</i> |
| | Comment | <p>EPA 2020 wood stove requirements have effectively precluded combustion air be brought from the outside, as the introduction cold winter ambient air will disrupt the kinetics of combustion and result in higher particulate emissions. This means that clean burning wood stoves and similar solid-fuel burning appliances are effectively required to be inside the pressure boundary (whereas with a sealed combustion with dedicated outside air, they didn't used to be), and so the effect of this regulation is to make efficient and federally compliant wood-stoves illegal. This is unfortunate and unnecessary, especially for rural and/or off-grid projects.</p> <p>If we speculate on the intent of this prohibition in the context, it is to prevent poor operation and smoke spillage into a depressurized home. However, the designation of 1000 sq.ft is arbitrary and is neither necessary nor sufficient for the proper and safe operation of both IAQ ventilation as well as solid fuel burning space heating. We encourage a more carefully crafted code which allows for for reasonable operation of both systems concurrently.</p> | | |