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Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222375	John LaFontaine (Energy Management Services)	Please add to the requirement for field ACCEPTANCE TESTING to the docket. Approval by any CSLB License for C20 (HVAC) and/or D62 (AIR/WATER BALANCING) to be allowed as CERTIFIED ACCEPTANCE TESTING PROFESSIONALS On all NON-RESIDENTIAL projects that require acceptance testing.	Staff finds that the intent of the ATTCP program is to improve enforcement of the acceptance test requirements in the Standards, in part by standardizing the knowledge and expertise possessed by testers and making them accountable to a certifying body. Allowing C20 and D62 licensed contractors to sign as certified ATT would undermine these efforts by the ATTCP program. Staff therefore finds that allowing C20 or D62 licences to "count" as ATT certification would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222375	1/26/2018
222376	Tenaya Asan	It is my understanding that duplex units are required to receive separate CF-1R reports. This requirement poses a significant challenge when a new second floor unit is being added over an existing ground floor home. I would like to suggest specific language be added to the code to address this issue.	Staff notes that this comment relates to compliance forms and not to proposed changes in the Express Terms; staff is able to consider revisions to compliance documentation such as streamlining redundant forms without considering changes to regulation. To the extent that the commenter is requesting changes to the regulations that apply to an addition of a second story as a separate dwelling unit, staff would need a more specific and robust proposal that recommends specific changes be made to Part 6 and provides rationale for these changes. Staff therefore invites the commenter to submit a complete code change proposal for 2022.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222376	1/26/2018
222415	Robert A. Shearer	Recommend not to change the term "Daylight Transition Zone" to "Daylight Adaptation Zone" as it is still used in other portions of the Standards. 100.1 and 130.1	Staff notes that the change to "Daylight Adaptation Zone" is part of an effort to align with ASHRAE 90.1 requirement and language when it is appropriate to do so; the most current version of ASHRAE 90.1 uses the term "Daylight Adaptation Zone". For this reason, staff changed the remaining occurrences of "transition zone" to "adaptation zone" to resolve the inconsistency noted by the commenter in a way that creates consistency with ASHRAE 90.1.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222415	2/2/2018
222418	Michael Scalzo (NLCAA)	"Area" and "Space" are not defined in Section 100.1. 100.1	Staff notes that the terms "area" and "space" are used interchangeably thru out the Title 24 Part 6 code as they mean and refer to the same entity - an extent set apart or available, or a particular extent serving a special function - as defined in the Merriam-Webster Dictionary. Staff does not find that a definition differing from the dictionary definition is necessary or appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§110.12(c): Language cleanup: Clarify projects over 10,000 ft² verses buildings over 10,000 ft². This was already clarified in a CEC Blue Print article.	Staff notes that "building" is defined as "any structure or space covered by Section 100.0 of the Building Energy Efficiency Standards." Thus, a "building over 10,000 ft²" can refer to a structure of this size or a space of this size; staff does not find that there is a way to clarify the use of this term that would retain its value.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§141.0(b)2(I) - ALTERATIONS: “completely replaced”, this needs to be defined, it can be interpreted differently. This term is repeated in Table 141.0-E.	Staff finds that "completely repalced" is clear and direct, and that a more technical definition is not necessary in the standards. Staff notes that additional explanation and examples are provided by the Compliance Manuals.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	It would seem unnecessary to prevent an ATT from joining another ATTCP due to a minor infraction such as a decertification due to an administrative issue with an ATTCP. We have concerns over a requirement that would prevent a decertified ATT to be certified by another ATTCP, this is especially true when an ATT is certified with two ATTCP’s.	Staff notes that the regulation (§10-103.1(c)3Biii) does not prevent an ATTCP from certifying a qualified technician, even if that technician has been decertified by another ATTCP. Rather, it allows the ATTCP to implement a prequalification requirement as they see fit.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	NLCAA approves of this new language [§10-103-1(c)3(B)(iii)] with additional comments. This note allows the ATTCP to determine if the candidate is viable. A decertification of an ATT may not always be based upon poor quality or ineffective work, failure to perform acceptance tests, falsification of documents, or failure to comply with the documentation requirements of these regulations.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	The language could be extended to include verbiage requiring the ATTCP to document the reasoning behind an ATT or ATE’s decertification for review by another ATTCP when deciding to allow them to become certified or not.	Staff finds that an ATTCP may share any specifics regarding their certified ATTs or ATEs as they see fit with another ATTCP; the regulations are intentional in only specifying that the ATTCP publicly identify the certification status (including decertification) of the ATT or ATE, as this is the minimum necessary for overall operation of the program and further directing ATTCPs on their operational decisions is not necessary. While further information may be request of the ATTCP, they are under no obligation to supply that information.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§130.1(a)2 - MANUAL AREA CONTROLS: It is not always feasible to have the area control in the enclosed space. Consider “in the area” (depending on the definition of area). During the testing process ATT’s have come across situations where the area control could not be placed in the enclosed space. These situations could occur when an ATT is working in scientific labs, hazardous environments, industrial manufacturing areas, studio recording rooms, public areas, and fire hazards to name a few. And/or add language “unless health and safety dictates otherwise”.	Staff added the phrase "and other areas where placement of a manual area control poses a health and safety hazard" to the Exception to this Section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018

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222418	Michael Scalzo (NLCAA)	§130.1(f)4 - CONTROL INTERACTIONS: Stable is not defined in §100.0. I am not sure what stable refers to. Maintains reference illuminance? Does not flicker?	Staff has removed this term and simplified the phrasing of this Section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§130.1(f)6 - CONTROL INTERACTIONS seems vague, does this refer to multilevel controls in §130.1(b)? Is this referring to a dimmer lowering the light level and/or raising the light level? If raising the light level is there a time limit before it must return to normal operation?	Staff notes that this Section refers to "multilevel controls" as specified by Section 130.1(b), whose function is to lower and raise lighting levels; staff does not find this to be vague. This Section is not specifying a time limit, it is specifying that a daylighting control shall not prevent the operation of a multilevel control. Staff finds that mention of additional components or functions (such as timers) would introduce a risk of confusion, and for this reason has not done so.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§130.2(c)2(B) - OUTDOOR LIGHTING CONTROLS AND EQUIPMENT: "130.4(a) is redundant with 130.4(a)6 in the sentence. 130.2(c)	Staff has rephrased this requirement to state only Section 130.4(a)6, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	§140.6(d) - EXCEPTION 3 to §140.6(d): I recommend providing requirements for the max elevation that the overhang can be from the top of the fenestration. If the overhang is on the tenth floor and the fenestration ends at the first floor the overhang would not have any impact on the daylit zone. Other conditions that should be considered for an exception: North facing fenestration that cannot receive enough daylight (reference illuminance) to pass the functional testing which is typically all North facing fenestrations. This could be added to NA7. Fenestration that is completely blocked; i.e. buildings directly up against other buildings, very close nearby buildings, stained glass windows. It needs to clearly be documented to the installers and ATT's, otherwise there may be confusion during the installation and functional testing. Exception 2 to Section 130.1(d); Exception 3 to Section 140.6(d)	1. Staff has added definitions for "overhang projection" and "overhang rise", as well as threhold criteria to determine whether the overhang qualifies for the exception, consistent with the commenter's suggestion. 2. When there is not enought daylight, a partial daylight test is already specified in NA7. (Staff also notes that north-facing fenestration may receive less direct sunlight compared to fenestration of other orientations (such as south), but is still likely to receive a usable amount of natural light.) 3. Staff notes that the daylighting acceptance test specifies to "simulate or provide bright conditions" and is not reliant on daylight availability. For this reason, an exception relating to this test procedure is not necessary. 4. Staff will be developing appropriate compliance documents following the rulemaking proceeding; staff will forward this comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	How will §130.1(d)3(A) - Exception 1 to §130.1(d) be documented and verified? This should also apply to Sidelit fenestrations. It needs to be clearly documented to the installers and ATT's, otherwise there may be confusion during the installation and functional testing. 130.1(d)	Staff finds that the document requirement for the exception is necessary to show that limited daylight is available to the skylight; staff's intent is to allow flexibility, given that specific site conditions can vary greatly and a single prescribed method would be unlikely to apply in all cases. For example, the document can be prepared by using a daylight simulation program that can model the amount of daylight in and around the building with the skylight, and be provided on the compliance and/or construction documents. Staff does not find that this flexibility is likely to cause confusion or uncertainty, though staff will also monitor this closely and make further changes in the next code cycle if found to be necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	How will §130.1(d)3(A) - EXCEPTION 2 to §130.1(d) be documented and verified? The issue will be during the testing procedures when verifying the overhang. It may not match the designed overhang and will need to be verified and documented by the ATT during the testing procedures. It will be critical how the code clarifies the requirements of this condition.	Staff has further simplified the language of this Exception; the compliance information will be provided on the compliance and/or construction documents.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	How will §140.6(d) - EXCEPTION 3 to §140.6(d) be documented and verified? The issue will be during the testing procedures when verifying the overhang, it may not match the designed overhang and will need to be verified and documented by the ATT during the testing procedures. It is critical how the code clarifies the requirements of this condition.	Staff finds that compliance with the exception can be documented in the same manner as other building measures. Staff will develop appropriate compliance forms following adoption of associated standards.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018

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222418	Michael Scalzo (NLCAA)	1. The issue will be during the testing procedures when verifying the overhang. It may not match the designed overhang and will need to be verified and documented by the ATT during the testing procedures. It will be critical how the code clarifies the requirements of this condition. 2. I recommend providing requirements for the max elevation that the overhang can be from the top of the fenestration. If the overhang is on the tenth floor and the fenestration ends at the first floor, the overhang would not have any impact on the daylit zone. 3. Other conditions that should be considered for an exception: North facing fenestration that cannot receive enough daylight (reference illuminance) should pass the functional testing which is typically all North facing fenestrations. This could be added to NA7. 4. Fenestration that is completely blocked; i.e. buildings directly up against other buildings, very close nearby buildings, stained glass windows. 5. It needs to be clearly documented to the installers and ATT's, otherwise there may be confusion during the installation and functional testing. Exception 2 to Section 130.1(d); Exception 3 to Section 140.6(d)	1. Staff has clarified the overhang requirements in part to ensure they can be verified, consistent with the commenter's suggestion. 2. Staff has added definitions for "overhang projection" and "overhang rise", as well as threhold criteria to determine whether the overhang qualifies for the exception, consistent with the commenter's suggestion. 3. When there is not enought daylight, a partial daylight test is already specified in NA7. (Staff also notes that north-facing fenestration may receive less direct sunlight compared to fenestration of other orientations (such as south), but is still likely to receive a usable amount of natural light.) 4. Staff notes that the daylighting acceptance test specifies to "simulate or provide bright conditions" and is not reliant on daylight availability. For this reason, an exception relating to this test procedure is not necessary. (To the extent the commenter is instead referring to cases when the presence of shading prevents an area from being considered a daylit zone, staff would expect that to already be shown on plans, consistent with daylit zone definitions.) 5. Staff will be developing appropriate compliance documents following the rulemaking proceeding; staff will forward this comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	We have concerns on how §130.2(c)3 - EXCEPTION 3 to §130.2(c)3 will be documented and verified. It needs to be clearly documented to the installers and ATT's, otherwise there may be confusion during the installation and functional testing. 130.2(c)	Exception 3 relating to obstructions has been removed, which has the effect of addressing the commenter's concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	Consider adding an exception to §130.1(b) for commercial kitchens. Division 104-Environmental Health Part 7. California Retail Food Code has mandatory light levels requirements for kitchens. "114252 - Lighting(c) Except in server stations where FOOD is prepared, at least 50-foot candles at a SURFACE where a FOOD EMPLOYEE is working with FOOD or working with UTENSILS and EQUIPMENT such as knives, slicers, grinders, or saws where EMPLOYEE safety is a factor." In the majority of projects that we have seen of commercial kitchens, it would not be allowable to dim the lighting due to health code requirements. 130.1(b)	Staff finds that there is no conflicts between the two regulations. Section 114252 of the Retail Food Code specifies the light level for the food preparation area while the area is in use. The multi-level lighting control requirement of Title 24 Part 6 specifies the lighting controls to have dimming or multi-level lighting control capability and it allows the lighting system to be operated on the desired light level as required for illuminating the areas. In particular, staff finds that lighting may be installed that exceeds the required minimum lighting level, and may be appropriately reduced when daylight is available or during hours when employees are not working with food or equipment .	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	Can you clarify and state in the code that the exception to §130.1(a) applies to operational or non-operational hours?	Exception to 130.1(a) applies to the building regardless of the building operation hours. For this reason, staff finds it is clearer to leave out the suggested change to this language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	Can you clarify and state that exception 3 to §130.1(c)1 applies to operational or non-operational hours?	Exception to 130.1(a) applies to the building regardless of the building operation hours. For this reason, staff finds it is clearer to leave out the suggested change to this language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	Automatic Daylighting Controls (§130.1(d)3(A)): Consider leaving TABLE 130.1-A as a requirement in this code section. The verbiage, "or the number of control steps provided by the multilevel controls" allows any multilevel control to be installed. This change will not require an ATT to ensure that requirements of TABLE 130.1-A are met during functional testing. You may see photo cells installed instead of multilevel controls.	Staff finds that inclusion of this provision referencing Table 130.1-A created confusion in cases where multilevel controls were not required by Section 130.1(b), including being interpreted as requiring multilevel controls even in cases where Section 130.1(b) stated they were not required. For this reason, removing the provision is necessary to prevent conflict.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

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222418	Michael Scalzo (NLCAA)	Section130.1(d)2 does not explain the hierarchy of all the daylit zones. The Secondary Zone is not included.	The code section does not dictate the hierarchy or the sequence of operation of the daylit zones; this heirarchy is found in Section 140.6(d), which specifies "All luminaires providing general lighting that is in, or partially in a Secondary Sidelit Daylit Zone, and that is not in a Primary Sidelit Daylit Zone shall [meet associated prescriptive requirements]." As secondary daylit zone requirements are prescriptive and may not be required for buildings pursuing performance-based compliance, staff finds that locating this language in Section 140.6(d) (and not in Section 130.1(d)) is necessary to ensure consideration of the secondary zone only occurs when it is required.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222418	Michael Scalzo (NLCAA)	AREA and SPACE are not defined. §130.1 and §130.5 contain both terms, not to mention other code sections; §130.5(d) states “kitchen areas in office spaces.”	A definition is necessary only when a term is used in a way that is different from, or more specific than, its ordinary usage. The terms "area" and "space" are used in ways that are consistent with their ordinary usage and meaning, therefore the dictionary definitions specified by Section 100.1(b) are sufficient for these terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222418	2/2/2018
222420	John Gillett (Ei Risk Management)	We believe that it is vital to the success of the updated Standards to extend those verification requirements to solar photovoltaic systems and batteries. The solar requirement has a major effect on compliance and without verification we could potentially see megawatts of solar energy installed incorrectly or inefficiently. Energy Inspectors is grateful for the opportunity to work with CEC staff on this issue and is happy to provide assistance to ensure PV systems installed per the 2019 Standards are properly verified.	Staff finds that the required inclusion of direct reporting of panel output provides the same assurance of performance as would be provided by verification, in addition to other benefits. Staff does not find that cursory inspection of installed battery systems would be able to identify issues affecting performance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222420	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	150.0 (o) 1. C. D. & F. - I am not sure of the distinctions between Dwelling Unit types. For instance, if I have a 2-story building where the 1st story is Commercial and the 2nd story are apartments. Are the apartments “multifamily” or “horizontally attached single family dwellings? This needs to be clarified.	Staff has removed of the term "attached" so that use of the term "multifamily" is more consistent, as requested by the commenter. This removes the appearance of a distinction between these types of dwelling units.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Appliance Directory: The “Small Air-Source Heat Pump” category needs to have the undefined “Heating Capacity (BTUH)” entry replaced with “Heating Capacity (BTUH) at 47 deg. F”, and “Heating capacity (BTUH) at 17 deg. F” so that one has the information needed to calculate the unit’s performance at the appropriate winter design temperature.	This comment relates to a compliance database maintained by the Energy Commission's Appliance Efficiency Program, and does not relate to proposed changes to regulatory language. Staff has passed this request on to the Appliance Efficiency Program.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Appliance Directory: The most common HVAC equipment used for Commercial buildings in much of California are Packaged Rooftop Units (RTUs). Many of these utilize Gas for heating and Electricity for cooling. I have not been able to find any Category in the Directory that includes these Gas/Electric units. This category needs to be added and populated.	This comment relates to a compliance database maintained by the Energy Commission's Appliance Efficiency Program, and does not relate to proposed changes to regulatory language. Staff has passed this request on to the Appliance Efficiency Program.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.0 (h): A Heat Pump’s heating capacity needs to be calculated using the units output at 45 & 17 degrees, and the location’s winter design temperature. If the calculated output, including supplemental electric resistance heat, meets or exceeds the required winter design heating load, the equipment meets the Mandatory sizing requirements.	Staff finds that the criteria for equipment sizing listed in Section 150(h) intentionally does not include supplemental electric resistance capacity, noting that capacity used for base load would no longer be supplemental by definition.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.0 (h): There is no Code required minimum cooling capacity required. However, the Commission should require the installer to also disclose the cooling performance at the Summer Design Temperature, so that the homeowner has the opportunity to query the installer as to the adequacy of the proposed equipment. The Appliance Directory does not include heating capacity at 47 and 17 degrees for these small residential heat pumps, which would be required to calculate the units heating performance. It is the responsibility of the installing contractor to select a unit that will satisfy the heating load, utilizing equipment that meets, or exceeds, the heating & cooling efficiencies defined in the CF-1R.	Owing to federal law governing appliance efficiency, the Energy Commission is not able to mandate disclosure or reporting of this additional information about this equipment. (Staff notes that for most systems this information is available in the AHRI Product Directory or on product cut sheets; staff can recommend disclosure when available as a Best Practice within the non-regulatory Compliance Manual or within other publications such as the Blueprint, though staff cannot do so in regulation.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018

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222423	Patrick Splitt (APPTECH, Inc.)	Section 150.0 (j)2 - Exception 2, Plastic/PEX piping penetrating metal framing should also have grommets etc. to protect those pipes from possible abrasion/failure.	Staff has removed the word "Metal" from the second sentence of the Exception so as to extend these requirements to PEX and plastic piping, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.0(m) 12A.i. - Is the 10-foot length for the entire duct system including return, the entire duct system excluding return ducts, or the length of any duct branches that exceed 10 feet each?	Staff notes that the 10-foot length refers to the cumulative length of the entire duct system, including supply and return ducts.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (c) 2. - Radiant Barrier - How do I install a radiant barrier in a Cathedral Ceiling? Does this mean that I cannot use the Prescriptive Method on a building with a vaulted ceiling? (Currently, the Performance software will not allow me to model a radiant barrier in a Cathedral ceiling, it should).	Staff finds that the prescriptive requirements assume a radiant barrier in a vented attic; a cathedral ceiling is not an attic. Cathedral ceilings will need to use the performance compliance approach, meaning that they are compared against a building following prescriptive options but are not required to implement the same prescriptive options. To the extent that the comment is in regards to how the performance modeling software models cathedral ceilings (rather than on the Express Terms), staff has directed the comment to appropriate personnel. Staff otherwise would advise that radiant barriers are not typically used for cathedral ceilings owing to the need for an air space, and thus that the commenter would likely be better served in finding other efficiency opportunities under the performance modeling approach.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (c) 6. - EXCEPTION – What about Fireplaces and Wood Stoves etc.? This exception should only refer to Electric Resistance equipment.	Staff finds that wood stoves and fireplaces are not supplemental heating systems, nor are they intended to be: such units are highly likely to exceed the Btu/hr cap and highly unlikely to be time-limited in any way. (Staff notes that rated appliances that are not part of the central mechanical system can be modeled as part of a zonal conditioing system.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (b) 3. B. – If a Furnace is required to have a higher than minimum AFUE for Performance compliance, that should also require field verification. The same applies for Water Heaters that require higher than minimum efficiencies to comply. (cross linked with Mark's comment log)	Staff finds that consideration of additional field verifications for these circumstances is outside the scope of this rulemaking, and at minimum would require analysis of any likely costs related to the additional verifications. Staff also notes that the energy impact of furnaces and water heaters is significantly lower than air conditioning. The large populations in cooling predominate climate zones and the difference Time Dependent Value multipliers of gas vs electric are also significant; showing cost effectiveness is not likely to be trivial and may not be possible. That said, this can be something to be considered for the 2022 Standard, and staff welcomes the commenter to submit a complete Code Change Proposal with the necessary data.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (b) 3. B. v. – Other potential problems with inputting specific 47 & 17 deg. outputs are that the modeled unit may be discontinued before the building is ready for installation or the installing contractor carries a different brand of heat pump. Telling a contractor that he or she cannot bid on a job because they do not carry Carrier heat pumps, for instance, would be considered Restraint of Trade.	Staff finds that the commenter misunderstands the provisions of this Section. As long as the selected equipment has equal or higher efficienies and capacities a switch may be done; the project is not held to the exact model stated on compliance forms, it is held to install equipment at least as efficient as the stated model. From a pratical standpoint building often goes through several iterations before the final set of plans are approved. Therefore the need to submit a revised or additional document noting the final selected mechanical system is not a burden.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (b) 3. B. v. – This entry for “Heat Pump Rated Heating Capacity” should be eliminated. In either case the Installing Contractor still needs to verify that the equipment installed will satisfy the required Winter Design heating load.	The compliance documentation is the only source that the homeowner can access that can provide information on the building features. Having this information provides the homeowner with information to proceed from in determining if there is a problem. For this reason, staff finds that retaining this entry is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.1 (b) 3. B. v. – When modeling a heat pump for 2019 Performance compliance the modeler has 2 choices. One is to input specific 47 & 17 deg. outputs. The other, is to have the program select these inputs internally. When selected internally, these outputs are not reported and therefore do not need verification. Verifying these outputs when manually input is an unnecessary and misleading exercise. This is because the manually input equipment definition may result in an undersized unit.	When the modeling users decides to define the equipment capacities the simulation will note the undersizing and penalize the budget by using electric resistance supplemental heating. In theory this inefficiency could be traded off by making improvments to other parts of the buidling - however the expense of doing this is likely much higher than correct sizing. For this reason staff does not find that this is a concern in practice.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222423	Patrick Splitt (APPTECH, Inc.)	Section 150.2 (a) 1. – EXCEPTIONS 1 & 2 from Section 150.2 (b) 1. A. (Alterations) should also be included in this (Additions) Section.	Staff finds that Exceptions 1 and 2 would be redundant with the language in Section 150.2(a)1A; for example, using Exception 2 in place of this language would raise one threshold by five square feet but lower another by one hundred square feet. For this reason, staff does not find that making this change would be appropriate. Staff additionally notes that Section 150.2(a) does not require compliance with Section 150.1(c)3B or C except in determining maximum allowed west-facing fenestration area.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018

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222423	Patrick Splitt (APPTECH, Inc.)	TABLES 150.1 A & B – A maximum U factor of 0.30 may be OK for windows, but it is impossible to attain, and therefore not a cost-effective feature, in a residential skylight (without resorting to exotic materials like Aerogel insulation). There should be a separate Prescriptive requirement for residential skylights. I suggest an NFRC U-factor of 0.44.	Staff finds that Exception 2 to Section 150.1(c)3A is sufficient in addressing the commenter's concern; users wishing to installing more than 16 ft2 of skylight will need to use the performance approach. Staff additionally notes that skylights in residential occupancies have a significantly higher negative energy impact than vertical glazing, thus necessitating the prescriptive values.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222423	2/2/2018
222424	Howard Ahern (Airex Manufacturing)	The 45 day language for Section 120.3 now has language that contradicts the intended requirement. Pipe Insulation itself cannot provide the protection from all the required potential damage and certainly not continuous solar and UV exposure.	The pipe insulation requirements in Section 120.3 have been rephrased for clarity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222424	2/2/2018
222424	Howard Ahern (Airex Manufacturing)	The protection should be removable not only for maintenance but to allow replacement if damaged physically or otherwise to preserve the pipe insulation.	Staff finds that adding a requirement that the protection be removable for maintenance could potentially impose additional costs, and it is unclear if it will provide any real benefit. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring replaceability is needed in order to consider this suggestion. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222424	2/2/2018
222438	Dave Bannister (AccurIC)	I would very much like to pass on AccurIC's thanks and appreciation for your efforts, both in terms of ensuring that Joint Appendix 8 remains in line with peer-reviewed research and in taking full account of the inputs that have been made to the Title 24 process.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222438	2/5/2018
222438	Dave Bannister (AccurIC)	It remains imperative in our view, that the tests and test procedures outlined in Joint Appendix 10, as referenced by Joint Appendix 8, remain unchanged. Future updates should, in our view, only be made to the levels of flicker allowed from qualifying products, with the obvious assumption being that such updates will be downwards, and apply over a wider range of frequencies. The use of JA 10 will ensure that all products are tested in accordance with the same procedure, using the same metrics and that these metrics and procedures are traceable to independently peer-reviewed research.	Staff notes that the Express Terms does not include changes to JA10; staff none the less appreciates the comment of support for JA10.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222438	2/5/2018
222445	Eric Beriault (energuy)	We believe the updated Standards should extend those verification requirements to solar photovoltaic systems and batteries. Without verification, there is increased chance lost savings due to improper installation. Third party verification of installed solar systems is vital to achieving the savings of the proposed Standards.	Staff finds that the required inclusion of direct reporting of panel output provides the same assurance of performance as would be provided by verification, in addition to other benefits. Staff does not find that cursory inspection of installed battery systems would be able to identify issues affecting performance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222445	2/5/2018
222446	Tien Peng (NRMCA)	NRMCA would like to request that the thermal properties of insulating concrete forms in Joint Appendix JA4 Table 4.3.13 be updated from the current values to updated values that reflect current product values. The Expanded Polystyrene (EPS) foam insulation used in Insulated Concrete Forms (ICF) has improved in thermal performance since the table was last updated. The update to the thermal performance values is not a substantive change and will provide updated and accurate thermal properties for ICF's.	The Commission is mandated to use insulation product performance values from the Directory of Certified Insulating Materials, which is published by the California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI). While the majority of polystyrene products (which include extruded polystyrene) have ratings of R-4 per inch or greater, there are products listed with values below R-4 per inch. For this reason, staff finds that the contents of the table as proposed are appropriate, and that additional modification to the table would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222446	2/5/2018
222449	Russ Scharer (Fulham Co., Inc.)	I'm concerned that the CEC has seemingly decided to specify which communication protocols can or must be used within the building interior. I strongly urge that a specific list of protocols not be named, or if named used for example only.	Staff has removed the phrase "for communications that occur witin the building" consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222449	2/7/2018
222450	Tom James	A code that allows for either a local or cloud based OpenADR 2.0 solution will allow the marketplace to deliver the most cost effective DR solution for the many different commercial building applications – especially when retrofitting our existing building stock.	Staff amended the requirements of Section 110.12 to permit cloud-based systems, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222450	2/7/2018

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Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222450	Tom James	I am also concerned that the CEC has decided to specify which communication protocols can or must be used within the building interior. By specifying the communication protocol, the CEC may be unwittingly barring much more open (and cost effective) communication protocols that are currently being readied for deployment in 2018. These “new” communication protocols are based on existing industry standards and have the potential to radically increase the percentage of demand response capable buildings in our state.	Staff have amended this Section to remove the phrase "communication within the building", consistent with the commenter's suggestion. Staff notes that the purpose of the Section is to ensure a minimal level of adressable communications hardware, and thus does not find that completely removing the requirement to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222450	2/7/2018
222450	Tom James	I continue to be concerned that if the new 110.12 language does not explicitly state the following (below), we may see mostly non-DR enabled buildings as we have in 2017: “DEMAND RESPONSIVE CONTROL is an automatic control that is capable of receiving and automatically responding to a demand response signal”	The definition of "demand responsive control" is present in the Definitions section (Section 100.1), and is amended to specify that the control is an automatic control. Staff does not find that stating definitions in Sections other than Section 100.1 would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222450	2/7/2018
222454	Dave Hegarty (Duct Testers)	DuctTesters believes that HERS verification is a necessary part of ensuring compliance with California’s energy code.The solar compliance credit is a major factor in compliance with the proposed 2019 Standards but there is no required verification. Without this verification, there will be no assurance that a large amount of energy savings attributed to new homes is actually affected.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222454	2/7/2018
222456	Lyn Gomes (Building Commissioning Association)	We recommend the code be amended to require that commissioning work for buildings over 50,000 square feet or with a complex mechanical system be performed by third party ANSIaccredited certified commissioning professional. (implementation language included on page 5)	Staff finds that adding a requirement to obtain accreditation would impose additional costs that are not described in the record; a complete code change proposal including a cost-benefit analysis would be needed in order for the Commission to consider this proposal. Staff therefore invites the commenter to complete a Code Change Proposal for this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222456	2/7/2018
222469	Greg Davis	Response to comment TN 222456. BAC quoted as Follows: "Currently, Title 24 - 2016 does not require the person performing commissioning on the project to be certified, anyone can do it." CA law requires the work has to be performed by a duly licensed Engineer or Architect in the state of California or by a person under the direct supervision of said professions, not just "anyone" off the street. Unlike the State of Washington referenced in the letter, CA made very clear who is responsible and the necessary qualifications. My recommendation is the current language not be changed and the both the CEC and BAC reconsider their positions. By removing the requirement of a liscensed professional to perform and/or oversee the commissioning of a building, it further dilutes and removes the designing engineer's responsibility and thereby increasing His liability for the design of which he is ultimatley the one guaranteeing its performance.	Staff notes that this comment is in response to a letter submitted by Lyn Gomes of the Building Commissioning Associate. Staff is not considering and has not proposed any changes to the existing commissioning language (in Section 120.8), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222469	2/8/2017
222480	Jeff Stein (Taylor Engineering)	Opposed to the proposed EXCEPTION 5 to Section 140.9(a)1: A computer room located in Climate Zones 1-9, 11-14, and 16 may be served by an integrated pumped refrigerant economizer certified by AHRI using AHRI 1360. (provides 8 reasons for his opposition)	Staff reviewed the additional analytical data provided for refrigerant economizers, and the analysis appears to be accurate and the concern valid. Staff therefore finds that it would not be appropriate to adopt an Exception based on an assumption of equivalent energy savings when there is data in the record showing that refrigerant-based equipment is not likely to perform equivalently; for this reason staff has removed the Exception consistent with the commenter's suggestion. Staff invites all interested parties to submit additional data for further consideration in future code cycles.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222480	2/8/2018

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Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. As a state with increasingly clean grid electricity, we should be driving toward "Zero Net Emissions" not "Zero Net Energy". Please don't require new homes to add solar PV -- the utilities and CCAs can clean up the grid in a much more cost-effective manner.	Staff finds that Zero Net Emissions and Zero Net Energy goals are compatible, and more deployed solar photovoltaics advances both goals, and that both large-scale and on-site renewable energy sources must be embraced in order to achieve the state's diverse energy and environmental goals. Staff additionally notes that the standards recognize and provide a compliance path for community-scale systems. The 2019 Standards also include compliance incentives for demand response and grid-harmonization measures, such as precooling, thermal storage, and battery storage systems. These complementary technologies maximize self-utilization of PV electricity generated onsite and minimize hourly exports back to the grid, and as they come into common use, they will benefit distribution systems and enhance local reliability.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. Rooftop solar electricity used to be substantially greener than grid power. The difference has disappeared in SVCE territory (now providing 100% carbon free electricity) and soon will for PCE and other CCAs across the state.	Staff finds that on-site and grid-scale renewable generation systems are complementary, not mutually exclusive: on-site renewables provide cost-effective energy and environmental benefits, including avoiding development of additional land and offsetting a need to increase transmission and distribution capacity. These compliment grid-level deployment of large renewable facilities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. Rooftop solar PV is unmetered and uncontrolled by CAISO. As such, it is not useful in balancing the grid.	Staff finds that in meeting the electricity demand of the dwelling, solar photovoltaics reduce the demand for grid power from that dwelling, which acts to decrease stress placed on the grid; the required size of the PV array is minimal and sized to the anticipated load so as to avoid creating negative grid impacts. In addition, on-site storage can be paired with the PV system to provide additional grid balancing and load minimizing effects.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. Solar PV is much more cost effective when implemented at utility scale, not at the residential scale. How many homeowners really need yet another system to maintain within their home?	Staff finds that on-site and grid-scale renewable generation systems are complementary, not mutually exclusive: on-site renewables provide cost-effective energy and environmental benefits, including avoiding development of additional land and offsetting a need to increase transmission and distribution capacity. These compliment grid-level deployment of large renewable facilities. Staff additionally notes that the community solar option in Part 1 Section 10-115 allows for installation of offsite, larger scale facilities where shown to be effective, allowing an at-scale approach to compliance. Utility-scale PV systems may be up to 500 megawatts (MW) or larger. The benefits include installed equipment costs that are less expensive per watt ($1.05 to $1.20 per watt) than an onsite rooftop system, and reduced system-wide CO2 emissions. The challenges include acquiring large plots of land, long transmission, distribution, and transformer infrastructure; and time consuming, and expensive environmental impact reports. The systems can also negatively impact sensitive wildlife habitats. It is important to include all costs and challenges when comparing a utility-scale PV system to onsite solar. Separately, staff finds that solar photovoltaic systems need very little maintenance: staff has estimated that an inverter replacement may be necessary every 10+ years, and that otherwise no maintenance actions are necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. The primary benefit of local generation (like rooftop solar) is to slightly delay future investments in upgraded transmission and distribution infrastructure. Delayed infrastructure investment helps PG&E exclusively because they're responsible for T&D (transmission and distribution). It doesn't help the CCAs themselves, though it does produce a very small financial benefit for their customers because PG&E's rates for T&D will grow just a little bit more slowly.	Staff finds that on-site solar photovoltaics provide beneifts directly to homeowners and tenants, not exclusively utility providers (nor, more specifically, PG&E). Further, the 2019 Standards compliance incentives for demand response and grid harmonization measures, such as precooling, thermal storage, and battery storage systems, can make the house invisible to the grid during most hours of the day, resulting in little or no CO2 emissions, minimizing infrastructure upgrades that could result in socialized costs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. The proliferation of EVs and the eventual deployment of vehicle to grid ("V2G") technologies will help solve the renewable storage problem. Don't mandate systems that will make the final outcome less cost effective than it needs to be.	Staff finds that on-site PV systems compliment increased deployment of electric vehicles - these benefit from proliferation of distributed energy resources (DER) including on-site PV and battery storage.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea. We want new homes to be all-electric. Spending extra dollars on a PV system means less money available for heat pump water heaters and space conditioners.	Staff does not find that installation of a solar PV system precludes the installation of electric heat pump furnaces and water heaters, and in fact that there is a synergetic effect when the load from these appliances can be met via on-site generation. (Staff notes that the installed cost of this equipment is roughly equal to the gas counterparts when the cost of installing gas service plumbing is considered.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018

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222481	Steve Schmidt (Home Energy Analytics Inc.)	I think more residential solar is a bad idea.When CCAs consider running local solar incentive programs the problem just gets worse. Not only are they incentivizing something that costs them extra money (see 1, 2 and 3), they are using precious staff time and spending money on marketing solar that they could have spent on marketing BE.	Staff does not find that a minimum solar photovoltaic system requirement precludes or interferes with CCA administration of their incentive programs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222481	Steve Schmidt (Home Energy Analytics Inc.)	In the age of expanding CCAs, I think more residential solar is a bad idea.Many new CCA's across the state (including SVCE and PCE here in Silicon Valley) buy electricity under contract from large-scale wind, solar and hydro resources for about 5 cents/kWh. It hurts them financially to buy electricity from NEM customers at about 15 cents/kWh. The more electricity they buy under NEM tariffs, the less money they have to use for local fuel switching & other beneficial electrification ("BE") programs, or further rate reductions.	Staff notes that the proposed Part 1 Section 10-109(k) expressly addresses and provides exception for situations where low utility rates cause on-site PV not to be cost effective. The Energy Commission conservatively chose 18 cents per kWh by considering the residential rates of several utilities, including Pacific Gas & Electric (PG&E), Southern California Edison (SCE), San Diego Gas & Electric (SDG&E), and Los Angeles Department of Water and Power (LADWP). Together, these utilities cover about 90 percent of the state's ratepayers. Given these data, it appears that the Energy Commission's estimate of statewide average electricity cost of 18 cents/kWh is on the low side. If the actual rates are higher than 18 cents per kWh, then savings will be even greater for the utility customer.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222481	2/8/2018
222493	Cy Eaton	JA 8.3.1 Efficacy Test sets a non-equivalent standard for assessing LED efficiency. The efficacy of all other sources are assessed based on source efficacy. However, the LM-79 standard for testing LED efficacy is based on a complete fixture. Although LM-79 is an appropriate standard, since the test yields fixture efficacy - not source efficacy - it puts LEDs at a disadvantage relative to other sources. Would it be appropriate to have an adjustment factor for LED efficacy, either a general adjustment or a specific adjustments per fixture type, based on industry average fixture efficiencies for similar fixtures using legacy sources (eg., 90% for 2x4 troffers; 70% for downlights)?	Staff finds that the IES LM-79 standard lays out an industry consensus method for performing electrical measurement of LED lighting products, including both LED luminaires and integrated LED lamps. Staff does not find that applying a modifier to the results of the test is either necessary or appropriate for the purpose of verifying compliance with a minimum efficiency standard, noting that unmodified LM-79 results were used as the basis for calculating and adopting the associated standard. Staff additionally finds that applying a modifier as suggested by the commenter would place JA8 out of alignment with industry norms, standards and practices.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222493	2/8/2018
222493	Cy Eaton	There is a power adjustment factor for Small Aperture Tunable Luminaires (Section 140.6.4.B). Does this adjustment apply to JA8 efficacy requirements and could a line be added in JA8 for clarification, to reference this adjustment and either confirm or negate its applicability? "Small Aperture Tunable-White and Dim-to-Warm Luminaires Lighting Power Adjustment. For qualifying small aperture tunable-white and dim-to-warm LED luminaires, the adjusted indoor lighting power of these luminaires shall be calculated by multiplying their maximum rated wattage by 0.75."	Staff finds that the commenter misunderstands the differences between residential and nonresidential lighting standards: JA8 requirements are a set of minimum performance criteria for lighting *devices* installed in a residential setting, and are entirely unrelated to the calculation of lighting power allowances for nonresidential *spaces,* including applying power adjustment factors to those allowances as specified in Section 140.6. A lighting power allowance is the amount of power that would be anticipated as necessary to adequately light a given space; it is essentially a power budget calculated based on the anticipated use of the space. Power adjustment factors provide an adder or multiplier to the allowance; importantly, they are not applied to the assessment of how much power a particular device or system would use if installed. Put another way, the purpose of a PAF is to increase the budget when appropriate, not to decrease how much a device would count against that budget, and applying PAFs on both the budget and the device side would result in confusion, create a risk of double-counting, and for these reasons would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222493	2/8/2018
222495	Darrell Smith (IWFA)	IWFA would like to request that the window film warranty requirements in Residential Appendix 4.2 .2.3 and Nonresidential Appendix 7.4.2.4 be updated from a 10 year Warranty Certificate to a 15 year Warranty Certificate. Window film has significantly improved in durability and effectiveness since the inclusion of this warranty requirement in the Title 24 St andards. The vast majority of window film products in the market are now supported with a 15 year or longer Warranty Certificate so a 15 year warranty requirement would reflect the current market practice in California.	Staff has amended this provision consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222495	2/8/2018

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222496	Jeff Stein (Taylor Engineering)	Exeption 3 to Section 140.9(a)1 should be revised. Our proposed change relaxes the requirement so the VAV box does not have to meet the entire computer room load if it maxes out the available house air and can provide at least 5 tons of cooling. 5 tons can easily be provided by a 16" cooling-only VAV box so this is not an onerous requirement. It also limits abusing this exception by claiming not to have any available economizer capacity.	Staff finds that the revisions recommended by the commenter to Exception 3 to Section 140.9(a)1 would be highly likely to change both the benefits and costs of using the noted equipment types to comply with Part 6, meaning that a complete analysis of benefits and costs would be needed to consider the recommended revisions. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff therefore invites the commenter to submit a complete code change proposal with all of the analysis necessary for consideration of this change for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222496	2/8/2018
222496	Jeff Stein (Taylor Engineering)	Exeption 3 to Section 140.9(a)1 should be revised. Our proposed revised exception is now limited to design cooling loads < 50 tons because adding the option to max out available house air would create an unintended loophole for data centers. Without the 50 ton limit a 2,000 ton data center with a small office space could claim this exception by running a 12" VAV box from the office to the data center. This exception was never intended to apply to large computer rooms and data centers.	Staff finds that the revisions recommended by the commenter to Exception 3 to Section 140.9(a)1 would be highly likely to change both the benefits and costs of using the noted equipment types to comply with Part 6, meaning that a complete analysis of benefits and costs would be needed to consider the recommended revisions. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff therefore invites the commenter to submit a complete code change proposal with all of the analysis necessary for consideration of this change for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222496	2/8/2018
222496	Jeff Stein (Taylor Engineering)	Exeption 3 to Section 140.9(a)1 should be revised. Our proposed revision deltes Criteria iii because it is largely redundant with proposed new wording and because Title 24 is a design standard so detailed sequences of operation belong in the user's manual, not the standard. Furthermore, iii is not sufficiently detailed to adequately describe the most efficient sequence. Rather than add the details and scenarios when the noneconomizer system should operate we felt it better to move it to the user's manual.	Staff finds that the revisions recommended by the commenter to Exception 3 to Section 140.9(a)1 would be highly likely to change both the benefits and costs of using the noted equipment types to comply with Part 6, meaning that a complete analysis of benefits and costs would be needed to consider the recommended revisions. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff therefore invites the commenter to submit a complete code change proposal with all of the analysis necessary for consideration of this change for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222496	2/8/2018
222496	Jeff Stein (Taylor Engineering)	Exeption 3 to Section 140.9(a)1 should be revised. The existing exception is basically for small/medium sized computer rooms in large office buildings where economizing can be provided most of the time from the spare capacity available from the central air handling system. It is not cost effective to put in a separate economizer system in this cases but it is cost effective to put in a VAV box from the central system. The existing requirement basically says you need to provide a VAV box that can meet the entire load of the computer room, when the house air system has spare capacity. For medium sized computer rooms there is not enough house air in the vicinity of the computer room to put in a VAV box sized for the whole computer room load and there is no reasonable way to get more house air onto that floor and to the computer room.	Staff finds that the revisions recommended by the commenter to Exception 3 to Section 140.9(a)1 would be highly likely to change both the benefits and costs of using the noted equipment types to comply with Part 6, meaning that a complete analysis of benefits and costs would be needed to consider the recommended revisions. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff therefore invites the commenter to submit a complete code change proposal with all of the analysis necessary for consideration of this change for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222496	2/8/2018
222496	Jeff Stein (Taylor Engineering)	Exeption 3 to Section 140.9(a)1 should be revised. The existing requirement basically says you need to provide a VAV box that can meet the entire load of the computer room, when the house air system has spare capacity. For medium sized computer rooms there is not enough house air in the vicinity of the computer room to put in a VAV box sized for the whole computer room load and there is no reasonable way to get more house air onto that floor and to the computer room.	Staff finds that the revisions recommended by the commenter to Exception 3 to Section 140.9(a)1 would be highly likely to change both the benefits and costs of using the noted equipment types to comply with Part 6, meaning that a complete analysis of benefits and costs would be needed to consider the recommended revisions. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff therefore invites the commenter to submit a complete code change proposal with all of the analysis necessary for consideration of this change for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222496	2/8/2018
222499	Jeff Stein (Taylor Engineering)	Delete proposed EXCEPTION 4 to Section 140.4(o). Rationale: This comes from the 90.1 version but it is not needed. Just because a space needs to be negative doesn't mean you shouldn't still transfer the available transfer air. If the available transfer air cannot meet the entire exhaust need then you can have a second source of makeup air. We do this all the time with labs, kitchens, etc.	Staff finds that alignment with ASHRAE 90.1 is desirable whenever possible, and the commenter does not explain how the ASHRAE provision is either erroneous or inappropriate. For this reason staff finds that maintaining alignment with ASHRAE 90.1 is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018

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222499	Jeff Stein (Taylor Engineering)	Delete proposed EXCEPTION 4 to Section 140.4(o). Rationale: This comes from the 90.1 version but it is not needed. Just because a space needs to be negative doesn't mean you shouldn't still transfer the available transfer air. If the available transfer air cannot meet the entire exhaust need then you can have a second source of makeup air. We do this all the time with labs, kitchens, etc.	Staff finds that alignment with ASHRAE 90.1 is desirable whenever possible, and the commenter does not explain how the ASHRAE provision is either erroneous or inappropriate. For this reason staff finds that maintaining alignment with ASHRAE 90.1 is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222499	Jeff Stein (Taylor Engineering)	If you disagree with deleting EXCEPTION 4 to Section 140.4(o). then please make it match the 90.1 version, i.e. add the following sentence from 90.1: "For spaces taking this exception, any transferable air that is not directly transferred shall be made available to the associated air-handling unit and shall be used whenever economizer or other options do not save more energy". This will save energy because the transfer air is still transferred indirectly thereby saving the need to fully condition more outside air. For example, suppose there is an office space with 500 cfm of available transfer air next to a lab space with a 1000 cfm fume hood. Just because the office cannot provide 100% of the fume hood makeup doesn't mean that you shouldn't at least indirectly transfer the 500 cfm to the lab space. This will save an additional 500 cfm of OA conditioning.	Staff finds that the proposed exception is not necessary as the scenario given would already be required to use the available transfer air under 140.4(o)3. Staff therefore does not find that adding the suggested phrase would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222499	Jeff Stein (Taylor Engineering)	Please add the underline language below to the new Exhaust System Transfer Air: EXCEPTION 3 to Section 140.4(o): Spaces that are required by applicable codes and standards to be maintained at a positive pressure differential relative to adjacent spaces. Rationale: Positive is in the 90.1 wording. If the space is required to be maintained at negative pressure then there is no problem transferring air to it. One could argue that almost any space with exhaust, like a toilet room, is required by the standard of care to be maintained at negative pressure to prevent odor migration. So it is important that this exception be limited to positive pressure spaces.	Staff has added the word "positive", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222499	Jeff Stein (Taylor Engineering)	Please delete section 130.5(b) Separation of Electrical Circuits for Electrical Energy Monitoring. Rationale: This is enormously expensive and not remotely cost effective. Few owners will pay for the submeters even if the circuits are separated and fewer still will look at the data and fewer still will know how to use the data to save energy.	Staff finds that the adoption record for this provision includes a demonstration of cost effectiveness; in order to rescind the requirement, staff would need to receive similar data showing that the original analysis is inaccurate in some way, or specifying conditions that were not considered in the analysis and cause the provision to not be cost effective. Staff therefore invites the commenter to submit a complete code change proposal with appropriate data for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222499	Jeff Stein (Taylor Engineering)	Please delete section 130.5(d) Circuit Controls for 120-Volt Receptacles and Controlled Receptacles. Rationale: This is also enormously expensive and not remotely cost effective. Occupants will not want their computers and other devices to shut off at night because they will lose data and remote functionality and waste time restoring devices and applications to desired functionality every morning. So they will quickly learn not to plug anything into the controlled outlets. Instead they will plug everything into the uncontrolled outlets.	Staff finds that the adoption record for this provision includes a demonstration of cost effectiveness; in order to rescind the requirement, staff would need to receive similar data showing that the original analysis is inaccurate in some way, or specifying conditions that were not considered in the analysis and cause the provision to not be cost effective. Staff therefore invites the commenter to submit a complete code change proposal with appropriate data for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222499	Jeff Stein (Taylor Engineering)	Please fix the typo in 120.3(a) by changing: a. From this: "Space Cooling Systems. All refrigerant suction, chilled water, and ~~brine lines~~fluid distribution systems" b. To this: "Space Cooling Systems. All refrigerant suction, and chilled water~~, and brine lines~~ fluid distribution systems" Rationale: the "and" should have been moved when brine was deleted. There are 2 types of fluid distribution systems here: refrigerant suction distribution systems and chilled water distribution systems.	Staff has edited this Section for grammar consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222499	Jeff Stein (Taylor Engineering)	Section 140.4(o)3: suggest adding the following: Transfer air is only available if it: a. is not required to satisfy other exhaust needs, and b. is not required to maintain pressurization of other spaces, and c. is transferable according to applicable codes and standards and to the class of air recirculation limitations in the California Mechanical Code. Rationale: These additional criteria are in ASHRAE 90.1 and are needed to properly define transfer air and prevent forcing someone to transfer air that is needed elsewhere for pressurization or exhaust or is unsafe to transfer because it comes from a less safe classification – e.g. you cannot transfer from a lab to an office.	This alignment requested by the commenter is present in the definitions for the terms "Air, Transfer" and "Air, Available Transfer" rather than in Section 140.4(o)3; staff finds that including the language in 140.4(o)3 would be redundant, and moving it from the definition would make it only applicable for this Section and not in other cases where the term is used. Staff therefore does not find that making the suggested change would be appropriate, while also noting that the proposed Part 6 does align with ASHRAE 90.1 in the way the commenter is requesting.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222499	2/8/2018
222500	Jeff Stein (Taylor Engineering)	Revision to proposed NA 7.5.17.2: Step 2: Physically occupy the space and confirm that the occupancy sensor detects the presence of an occupant in the zone. Rationale: We only want to detect a person in the space if there really is a person in the space. This is needed to confirm the sensor is working correctly.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222500	2/8/2018
222500	Jeff Stein (Taylor Engineering)	Revision to proposed NA 7.5.17.2: Step 5: ~~Adjust the setpoint to initiate heating or cooling.~~ Adjust setpoint outside of occupied heating/cooling deadband but inside the occupied standby deadband. Confirm zone is in heating or cooling mode. Rationale: If you adjust the setpoint too far then it will not go into unoccupied standby.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222500	2/8/2018
222500	Jeff Stein (Taylor Engineering)	Revision to proposed NA 7.5.17.2: Step 6: ~~Confirm that the zone is vacated~~ Physically vacate the zone. Rationale: We only want the system to recognize the zone as vacant if it is in fact vacant.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222500	2/8/2018
222500	Jeff Stein (Taylor Engineering)	Revision to proposed NA 7.5.17.2: Step 7: Confirm that within 5 minutes of being vacated the setpoint is setup or setback and the zone is within the occupied standby deadband. Rationale: This is needed to clarify that the space will not be within the occupied deadband, only within the occupied standby deadband.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222500	2/8/2018
222500	Jeff Stein (Taylor Engineering)	Revision to proposed NA 7.5.17.2: ~~Step 9: Occupy the space with the occupant sensor and confirm the system provides ventilation.~~ Rationale: Step 9 can be deleted as this has already been confirmed in Step 4.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222500	2/8/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222505	Alex Boesenberg (NEMA)	NEMA Lighting Systems Division members fully support many outdoor lighting recommendations currently being advocated such as: a. use of light control options such as motion sensing, time-of-night dimming, and stepped power switching (including an appropriate use of complete shutoff for some applications) to conserve energy; b. luminaire shielding to curtail excessive uplight, glare, and light trespass; c. limiting illumination to the specific task or targeted area; and d. designing for the minimum light levels and connected power load necessary for the task.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222505	2/9/2018
222505	Alex Boesenberg (NEMA)	NEMA Lighting Systems Division members do not believe there is sufficient data to recommend that outdoor lighting systems be limited to any CCT.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222505	2/9/2018
222505	Alex Boesenberg (NEMA)	The research conclusions of previous studies on disruptions to circadian rhythm and melatonin production are not applicable to today's technology decisions.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222505	2/9/2018
222508	Saeed Bandi (Bandi Engineering and Energy Consulting)	Fan power consumption is always a penalty. Regardless of w/cfm used. State needs to be more lenient toward the fan power.	Staff finds that the 2019 requirement is in line with 90.1, which is the national model code. Staff therefore finds that being "more lenient toward fan power" would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222508	2/9/2018
222509	Michael Scalzo (NLCAA)	§130.1(d)3(A) - EXCEPTION 2 to §130.1(d): If a window (fenestration) has a width of 75 feet and the overhang has a width of 10 feet at the center of the fenestration, and meets this exception, will the entire fenestration be excluded from the daylit controls requirement? This is a concern, in scenarios where you have a building that has fenestration around the entire building (one primary zone), would the exception apply to the entire daylit zone extending around the building? Another good reason to have cardinal direction requirements for daylit zones.	Staff has revised the language of this Exception consistent with the commenter's suggestion: the Exception now specifies that it applies "where the overhang covers the entire width of the vertical glazing", and specifies directions relating to cardinal directions.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	§130.1(d)3(A) - EXCEPTION 2 to §130.1(d): The definitions in 2019 will now include Skylit, Primary and Secondary daylit definitions, overhang daylit zones should be added in to §100.0.	Daylit zones adjacent to overhangs will fall into the category of primary sidelit daylit zone or secondary sidelit daylit zone. Staff finds that it is not necessary to create a new category of overhang daylit zone.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	§130.1(d)3(A) - EXCEPTION 2 to §130.1(d): The Standards should also cover how the width of the overhang will be addressed.	Staff revised the language of the Exception to specify that the area with the same width as the overhang can be qualified for the Exception, consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	§130.1(d)3(A) - EXCEPTION 2 to §130.1(d): We are concerned that the angle of the natural light will impact the results of the functional testing. If the incoming natural light is at an angle (i.e. 45°) from the fenestration and overhang, this will impact the area adjacent to the overhang area in the daylit zone. Under/Over dimming in daylit areas adjacent to the overhang area will be impacted due to the angle of the incoming natural light.	Staff finds that Exception 2 to Section 130.1(d) and Exception 3 to Section 140.6(d) directly address the interaction of overhangs with daylit zones and allows for such spaces to be exempted, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	An occupancy sensor that is functionally tested by two different entities (LATT/MATT/Mech Contractor) could create conflicting results during functional testing.	Staff finds that the mechanical acceptance test specifies only that the tester "Confirm that the occupancy sensor detect the presence of an occupant in the zone." The test does not specify or include any configuration of the sensor in a way that would be likely to conflict with or affect the lighting acceptance test; the test is ultimately not a test of the sensor, but of the mechanical system control. To the extent that a sensor may not be found to be detecting the presence of occupants in the zone, this issue would affect lighting and mechanical tests identically. Staff therefore finds that the acceptance test procedures specified in the Express Terms are appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	LATT's are experienced, trained and certified through an ATTCP in advanced lighting controls, specifically trained in occupancy sensor functionality and testing. During functional testing an LATT will verify that the occupancy sensor is placed, programmed and functions to the requirements of NA7.6.2.3.	Staff notes that mechanical ATTs are also subject to experience, training and certification requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222509	Michael Scalzo (NLCAA)	NA7.5.17.1 (a) and (b) should remain the responsibility of the LATT if the occupancy sensor (O/S) is a lighting control device. If an adjustment is made to the O/S to satisfy the MATT inspection after an LATT has functionally tested the O/S then it could alter the LATT's testing results. This could lead to: O/S not operating properly due to improper location, or replacement of the device; O/S not programmed properly due to altering the programming while moving the O/S, especially true if the O/S is disconnected from the lighting control system and re-connected; An ATTCP complaint could be filed against the LATT if the O/S is altered after the LATT testing (altered due to MATT testing) and doesn't function correctly; If the O/S is altered due to MATT testing after the LATT testing it would require re-testing by an LATT; this leads to cost impacts of re-testing.	Staff finds that the function of an occupancy sensor is to produce a signal when the space is occupied, so that other devices can receive the signal and take appropriate action. As the acceptace test for mechanical systems only specifies that the tester "Confirm that the occupancy sensor detect the presence of an occupant in the zone", staff does not find that the mechanical tester would be likely to make any alteration to the sensor except in cases where the sensor fails to detect occupants. In this case, the occupancy sensor is already failing to perform its basic function, and would fail testing regardless of any action by the mechanical tester to restore it to a functioning state. Staff therefore finds that determining that the sensor is performing its basic function is necessary for testing mechanical controls that rely on a signal from an occupant sensor, and that this minimal requirement is unlikely to result in re-test of associated lighting controls except in cases where re-testing would already be appropriate (due to a failed or failing sensor).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	NA7.5.17.1(b): This form of verification is already required by an LATT as part of a lighting controls system. If controlled outlets are also controlled by the O/S then the LATT has to verify the lighting control system functions correctly and is §110.9 compliant.	Staff notes that the confirmation in the mechanical test is necessary to rule out failure based on a failing sensor. Mechancial ATTs will not be performing testing related to receptacle controls.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	There are no requirements to meet 2016 Title 20 (2019 §110-9) in NA7.5.17.	Staff finds that the requirements of Section 110.9 for occupancy sensors are already included in the NA7.6.2 for the lighting ATT's to perform. Staff therefore finds that there is no need to repeat those procedures under Section NA7.5.17.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	I understand that NA7.5.17 is only a construction inspection and the installer is responsible for the adjustments, but real-world scenarios are that the installer will make any adjustments needed to pass the ATT testing.	Staff finds it unlikely that any adjustments made to ensure the basic function of the occupancy sensor consistent with passing NA7.5.17 would have a detrimental effect on the ability of the sensor to also pass (or remain configured to pass) NA7.6.2.3; in rare cases where an issue exists, communication between the ATT and the installer is likely sufficient to ensure a scenario where both tests pass (without additional rework). Staff does not find that this risk is significant enough to warrant elimination of the NA7.5.17 specifications, especially given that a functioning sensor is necessary to the overall functioning of the mechanical control.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	Installation requirements are verified by an LATT, NA7.5.17 lacks these requirements. For example, it is not uncommon to find a low bay sensor used for a high bay installation which could pass the functional testing but may not work correctly all the time.	Staff notes that the example cited by the commenter is a unique scenario where the wrong type of occupant sensor gets installed; this is highly likely not meeting the construction documentation and would be a general compliance issue for the project. Staff finds that it is not possible for regulatory language (or verification procedures) to account for every possible way that a mistake may occur, and that verification testing ensures a robust ability to detect and correct errors prior to occupancy. Staff additionally finds that the noted scenario is unrelated to the need for a mechanical tester to verify the basic functioning of the occupancy sensor so that the test of the mechanical system can be successfully performed. Staff therefore finds that the language in the Express Terms is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	Suggested Language: NA7.5.17.1 Construction Inspection Prior to Functional Testing, verify and document the following: (a) ~~Verify that the occupancy sensor is placed so that it can detect occupants in the space without obstruction.~~ Review and verify that the area has passed NRCA-LTI-02-A testing, if applicable. (b) Confirm that the mechanical system is controlled by ~~an independent signal if~~ the occupancy sensor if it also controls the lighting. (c) Confirm that the space is designated as elgible to be in occupied standby mode as specified in Section §120.2(e)3.	Staff finds that the suggested change would have the effect of incorporating the NRCA-LTI-02-A document by reference into the regulations; this does not appear intended by the commenter, though it would lead to inconsistency in the separation between the regulatory text and the forms used to document regulatory compliance. Staff also notes that the proposed language does not specify what to do if the noted testing is not applicable; staff finds that the prior direction to verify placement can be met by verifying that a prior test that depends upon appropriate placement was successfully performed, and also accounts for cases where a prior test was not performed. Staff also finds that the purpose of specifying an independent signal is misunderstood: the control must also have the effect of causing both the lighting and the HVAC system to engage in appropriate behaviors, and not send a single signal that only one of the systems will respond to. Staff finds that retaining this specification is appropriate as it is necessary to ensure all expected behaviors are able to occur.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018
222509	Michael Scalzo (NLCAA)	Will the sampling of NA7.6.2.3 apply to NA7.5.17?	The sampling provisions applicable to lighting systems are not applicable to mechanical systems.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222509	2/9/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222510	Wayne Alldredge (VCA Green)	Response to comment TN 222456. For the proposed language in Section 120.8(e) and 120.8(d), the consistent language should state this: For buildings with a conditioned space greater than 50,000 square feet and all buildings with complex mechanical systems servicing more than 10,000 square feet: (1) The OPR and BOD completed as part of sections 120.8(b) and (c) shall be reviewed by a third party certified commissioning professional. (2) The requirements of sections 120.8(e), (f), (h)1, and (i) shall be performed by a third party certified commissioning professional.	Staff finds that adding a requirement that the OPR and BOD be reviewed by an independent third party could potentially impose additional costs. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222510	2/9/2018
222510	Wayne Alldredge (VCA Green)	Response to comment TN 222456. The proposed language is eliminating the third party requirement which we believe is simply a typographical error. The proposed language should state: For buildings less than 10,000 square feet, this signer may be the engineer or architect of record. For buildings greater than 10,000 square feet but less than 50,000 square feet, this signer shall be a qualified in-house engineer or architect with no other project involvement or a third party engineer, architect, or contractor, or certified commissioning professional. For buildings greater than 50,000 square feet and all buildings with complex mechanical systems serving more than 10,000 square feet, this signer shall be a third party engineer, architect, or contractor certified commissioning professional. Note that the third party appears to have been inadvertently stricken from only the final example. This must be retained.	Staff finds that Division 3 of the Business and Professions Code is explicit in identifying persons who are eligible to accept responsibility for building design (responsible persons): under Division 3 of the Business and Professions Code, this eligibility is restricted to licensed architects, engineers, and contractors. The current language of this Section is accurate in describing the requirements of Division 3, and only imposes an additional requirement that projects of sufficient size be subject to a level of independent review. As the independent reviewer signing these documents must be capable of accepting responsibility for the building design, staff finds that including commissioning professionals in this list would be contrary to the requirements of Division 3. For this reason, staff finds that making the requested change would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222510	2/9/2018
222523	Gary R. Flamm	It is not correct to apply a maximum outdoor lighting CCT for on-site lighting based upon the American Medical Association Report because it specifically addresses “Community Lighting,” which is described in the report as street lighting. The proposed CalGreen language cites Title 24, Part 6, Section 140.7, which does not regulate street lighting, but regulates on-site lighting. The Report does not make recommendations for on-site lighting.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222523	2/12/2018
222523	Gary R. Flamm	According to the Lighting Research Center (LRC) at Rensselaer Polytechnic Institute, it is not appropriate to establish a CCT standard for outdoor lighting as a means to address the health concerns raised by the American Medical Association Report.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222523	2/12/2018
222523	Gary R. Flamm	It may be environmentally sensitive for California to address the concerns raised in the Report in outdoor Lighting Zones (LZ) LZ0, LZ1, and LZ2. The five outdoor lighting zones are built primarily around population densities, as follows: LZ0 - Very Low - Undeveloped areas of government designated parks, recreation areas, and wildlife preserves. LZ1 – Low - Developed portion of government designated parks, recreation areas, and wildlife preserves. LZ2 – Moderate - Rural areas, as defined by the 2010 U.S. Census. LZ3 - Moderately High - Urban areas, as defined by the 2010 U.S. Census. LZ4 – High – None – Local AHJ must process and submit a request to CEC.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222523	2/12/2018

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222523	Gary R. Flamm	Highway lighting is administered by the California Department of Transportation (CalTrans). Other public street lighting is administered by a number of different public entities. Senate Bill 5X (Statutes of 2001) requires the California Energy Commission to consult with Caltrans when adopting changes to outdoor lighting. Although it is understood that Senate Bill 5X gives authority to the California Energy Commission (CEC) to regulate public street lighting, the CEC has never conducted a rulemaking proceeding to regulate public street lighting. I have seen no evidence that the proposed AMA recommendations for street lighting have been vetted with Caltrans.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222523	2/12/2018
222524	Jim Hodgson (CHEERS)	After the A, B and C subsections in JA7.7.1.2.2, we suggest the following language: Application Programming Interfaces (APIs) provided by a HERS Provider are not subject to the EDDS data exchange requirements.	Staff intends the data exchange between the Data Registry and the External Digital Data Source (EDDS) described in Joint Appendix JA7 to be managed by the Data Registry Provider, and that the data exchange will be performed using industry best practices for security and integrity of the data. The Requirements for EDDS approvals deliberately do not specify methods of data exchange, thus staff does not agree that specific rules for Data Registry APIs should be crafted and included in JA7. If the Data Registery Provider API is an element of the data exchange between an EDDS and the Data Registry, then the Provider will be expected to disclose in the documentation included with the application for approval by the Energy Commission, use of the API including description of any Internet-based data gateway interfaces used for sharing the compliance data with third parties.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	Suggested change to proposed §10-103(1) A vi – Documentation, Certificate of Compliance: Be signed by the responsible person eligible under Division 3 of the Business and Professions Code to accept responsibility for the design to certify conformance with Part 6, or shall be signed by their Authorized Representative. When document registration is required by Section 10-103(a)1, the signature shall be an electronic signature on an electronic document in accordance with the electronic signature specifications in Reference Joint Appendix JA7.	Staff finds that the proposed change would conflict with Division 3 limitations on who may sign in this capacity, and therefore that the change would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	Suggested change to proposed §JA7.7.1.1 Keyed-in Data Entry: Data Registries shall have the capability to receive data input transmitted from an authorized user's computer ~~system keyboard entry devices and pointing devices~~ or mobile device when the authorized user has logged on to the Data Registry web service.	Staff edited this Section to use the term "Personal Computing Device" (and added the term to the Definitions section in Joint Appendix JA7), which is inclusive of devices such as mobile devices and tablets and therefore allows the use of mobile devices consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	Suggested change to proposed §JA7.8.5 Data Registry User Manual:Each Registration Provider is required to publish a Data Registry User Manual. This requirement may be met by incorporating help screens into the Data Registry user interface or making online tutorials readily accessible. ~~however, A~~a printed or electronic version ~~which includes~~ including all help screen items and/or tutorials must be submitted with the application. The Data Registry User Manual shall provide guidance for building permit applicants and enforcement agency officials to enable correct use of the Data Registry, and assists with preparation of registered documentation used for submittals to enforcement agencies and other parties to the construction project.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	Suggested change to proposed §RA2.7.3 HERS Provider Responsibilities: a. HERS Providers shall ~~assign~~ allow a HERS Rater to conduct independent field verification and diagnostic testing of the installation work performed by the participating Third Party Quality Control Program installing contractors, and to submit Certificates of Verification at the close of the sampling group.	Staff finds that there is a substantive difference between "shall permit a HERS rater to do X" and "shall direct a HERS rater to do X", and that only providing permission to perform an action does not guarantee that the action will be performed. Staff therefore finds that "assign" is a more appropriate word than "allow" in this context.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222524	Jim Hodgson (CHEERS)	Suggested change to proposed 2019 language: b. ~~HERS Providers shall notify enforcement agencies when groups close or exceed six months without closing~~ The HERS Provider shall format its Data Registry to allow enforcement agencies to review information related to Third Party Quality Control Programs within their jurisdiction.	Staff finds that the enforcement agencies are already expected to be authorized to view information in the Data Registry as stated explicitly in JA7. Staff does not find that a building department would be inconvenienced by receiving notifications of group closures, and therefore does not find that eliminating the requirement to notify would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	To fully achieve the anticipated savings we believe it critical to have third-party verification of required solar system installation and operation.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222524	Jim Hodgson (CHEERS)	We encourage the Commission to release the DRRM at least 18 months prior to implementation date so the HERS Providers have adequate software development time to prepare for 2019 submission.	Staff intends to release the DRRM 12 months in advance of the effective date of the 2019 Standards, consistent with the anticipated release of other Compliance Manuals. Staff may make available updated versions of selected compliance document pseudocode layouts and xml schemas earlier than the scheduled publish date for the DRRM in order to assist the Data Registry Provider with their software development schedule.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222524	2/12/2018
222525	Brady Brooks (CxSolutions)	Commenter proposes to require that the commissioning work and documents required by Section 120.8 be prepared and reviewed by certified commissioning professionals. The commenter is also "open to another form of language in this standard that ensures that a Certified Building Commissioning Professional meets industry standard practices in leading, planning, coordinating, managing, and implementing the commissioning process."	Staff finds that a proposal to require that persons performing commissioning possess specific certifications is likely to increase costs, and therefore that a cost analysis is necessary in order for the Energy Commission to consider the proposal. Staff invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222525	2/12/2018
222525	Brady Brooks (CxSolutions)	SECTION 10-102 – DEFINITIONS Proposed Revision – Include the following definition: CERTIFIED BUILDING COMMISSIONING PROFESSIONAL. An individual who is certified by an ANSI/ISO/IEC 17024:2012 accredited organization to lead, plan, coordinate, manage, and implement the commissioning process. The individual's accredited certification required by the referenced standard provides a measured level of experience and competence with the various whole building commissioning processes and the ability to deliver quality service. Accredited organizations include, but are not limited to, AABC Commissioning Group (ACG), ASHRAE, Building Commissioning Certification Board (BCCB), and National Environmental Balancing Bureau (NEBB).	As staff is not proposing to add the term "certified building commissioning professional" to Part 1 Section 10-103, staff finds that it would not be appropriate to add a definition for the term to Part 1 Section 10-102.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222525	2/12/2018
222547	Russell King (CalCERTS, Inc.)	It is our hope that Commission staff will involve the HERS providers and raters and reconsider the exclusion of HERS verification of this extremely important energy feature. PV is integral to California's Energy goals -- ensuring proper installation of PV with a HERS Verification ensures that these goals are actually realized and not just "on paper".	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222547	2/14/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222547	Russell King (CalCERTS, Inc.)	Joint Appendix JA11 is the new verification protocols for PV systems. As written it REMOVES HERS Verifications and adds even more responsibility on the backs of code enforcement personnel. Not only is this going in the wrong direction by making enforcement more burdensome on building departments, it raises serious procedural issues. This substantive change to the CASE study recommendation was made without notification, consultation, or even explanation since it was not mentioned anywhere in the Initial Statement of Reasons. In our previously docketed comments, dated July 27, 2017, we specifically requested to be involved in the development of any verification protocols. We were not made aware of this change and it has since come to our attention that CALBO was not consulted either.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222547	2/14/2018
222548	Kelly Seeger (Philips Lighting)	We request that NEMA 77 be reinstated as a method for qualifying products to Title 24 JA8. Use of NEMA 77 should be considered a strengthening of the requirements for temporal light artifact (TLA), not a weakening.	Staff notes that "reinstated" refers to a proposal in the pre-rulemaking draft of the Express Terms to allow use of NEMA 77 as an equivalent alternative to JA10 in testing lighting for flicker effects; this was not proposed within the Express Terms owing to received public commentary expressing concerns with NEMA 77, some of which have been resubmitted to the formal rulemaking record despite staff's decision not to propose its inclusion. Staff additionally notes that while NEMA 77 is more stringent than JA8 values for frequency range below 60 Hz for TLA it is potentially less strict for values above 60 Hz (in addition to the other concerns noted by commenters). Staff finds that NEMA would need to fully address the concerns raised by stakeholders in order for staff to consider including the standard in lieu of JA10 testing; staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222548	2/14/2018
222566	Magdalena Brum	2) Add the option for a certified commissioning professional to Section 10-103;	Staff finds that Division 3 of the Business and Professions Code is explicit in identifying persons who are eligible to accept responsibility for building design (responsible persons): under Division 3 of the Business and Professions Code, this eligibility is restricted to licensed architects, engineers, and contractors. The current language of this Section is accurate in describing the requirements of Division 3, and only imposes an additional requirement that projects of sufficient size be subject to a level of independent review. As the independent reviewer signing these documents must be capable of accepting responsibility for the building design, staff finds that including commissioning professionals in this list would be contrary to the requirements of Division 3. For this reason, staff finds that making the requested change would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222566	2/15/2018
222566	Magdalena Brum	3) Add wording to require a certified commissioning professional to large projects or projects with complex mechanical systems (in line with design review requirements in current code) to section 120.8.	Staff finds that adding a requirement that the person performing commissioning possess an ANSI certification or accreditation could potentially impose additional costs. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222566	2/15/2018
222566	Magdalena Brum	I recommend the code be amended to require that commissioning work for buildings over 50,000 square feet or with a complex mechanical system be performed by third party ANSI-accredited certified commissioning professional.	Staff finds that adding a requirement that the person performing commissioning possess an ANSI certification or accreditation could potentially impose additional costs. For this reason, staff finds that a complete code change proposal describing the costs and benefits of requiring certification is needed in order to consider this suggestion. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222566	2/15/2018
222566	Magdalena Brum	My recommendations for modifications to the code follow those already recommended by the California Chapter of the Building Commissioning Association: 1) Add a definition for certified commissioning professional to section 10-102;	As staff is not proposing to add the term "certified building commissioning professional" to Part 1 Section 10-103, staff finds that it would not be appropriate to add a definition for the term to Part 1 Section 10-102.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222566	2/15/2018
222567	Naomi Miller	I suggest NEMA 77 be adopted provisionally. It needs ongoing research and discussion, and the target value of SVM needs to be 1.0 rather than 1.6. Furthermore, SVM is a metric based on VISIBILITY of flicker, not NEUROLOGICAL RESPONSE to flicker. If we learn that those neurological responses are not related to visibility of flicker, then we may have to revisit this issue.	To the extent that a measure needs further research, staff finds that the most appropriate regulatory approach is to consider adoption after all necessary research is concluded. This avoids disruption that occurs if models tested using a new metric were later disallowed, and in particular if said products are already permanently installed into completed buildings. Staff therefore does not find that a "provisional" approval would be appropriate. (Staff does note that flicker that is not visible is still capable of causing harmful neurological response, and thus a threshold based solely on visibility would not fully satisfy the purpose of the existing JA10 requirements in preventing harmful effects.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222567	2/15/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222568	Adrian Osgood	I'm writing to voice my concern over the proposed removal of Solar PV systems from the list of HERS verifications. To exclude HERS verification of PV would undoubtedly lead to the installation of underperforming/ over-shaded systems thereby undercutting ZNE aspirations.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222568	2/15/2018
222572	Avery Colter (Fard Engineers)	How is the CEC planning to implement the NSHP? Are building department officials going to keep in mind to get the work done – both the PV verification itself and, for extra credit tiers, the other efficiency measures in the buildings – within the NSHP's deadlines?	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff notes that the New Solar Homes Partnership program has ended per Senate Bill 83 (Committee on Budget and Fiscal Review, Chapter 24, Statues of 2015) which required that any funding made available for the continuation of the NSHP, under Public Utilities Code Section 2851(e) (3), to be encumbered through the issuance of reservations no later than June 1, 2018.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222572	2/15/2018
222572	Avery Colter (Fard Engineers)	Keep HERS rating of PV systems at least as an.option	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222572	2/15/2018
222573	Jim Taylor (AIR-TITE Duct Testing)	Removal of the HERS requirement for "Solar" is a HUGE mistake. I don't see how the elimination of this requirement can be successful.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222573	2/16/2018
222574	Barbara Chapman (BSC Green Solutions)	Local building departments are already overwhelmed and confused by the energy efficiency-related inspections they do to verify compliance with the mandatory measures required in section 150.0 of the standards. Adding PV verifications to their workload would be a disaster for them and for California's commitment to Zero Net Energy.	Staff has revised the requirements applicable to building officials to make it clear that their verification step is ordinary verification of compliance documentation.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222574	2/16/2018

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222575	Carlos Dominguez	Removing a HERS rater from an installation does no one a favor...no one. NOT the owner, the bank, nor the home's future appraised value...Mistake removing a productive inline service for a small price that the builders normally pay for. The value of the its service in no way does it outweigh the benefits across the board. If it's cost, regulate how much the builder charges for a service he doesn't provide.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222575	2/16/2018
222586	Howard Ahern	Clearly the intent of protection is independent of the pipe insulation as such the surface of the insulation cannot meet the protection or vapor retarder requirements as put forward in the 45 day language of Section 120.3 . California took the language from 90.1 standard on pipe insulation protection into its Energy standard in 2005 Changes have been made to the language to write it into performance language that can be effectuality enforced . the current 45 day language is confusing and miss the intent of the standard that protection and vapor retarding be independent of the insulation to maintain the insulation systems thermal conductivity and allow for maintenance to insure performance and reduce cost.	Staff has removed the word "surface" from the phrase "surface or cover", consistent with the commenter's suggestion.Staff finds that there are types of products (such as rubberized products) that can provide both insulating and vapor retarding effects, and that the term "pipe insulation" can be understood to refer to a multi-component system as well as to the specific material providing an insulative effect, such that the phrasing "include, or be protected by" is appropriate as it relates to providing a Class I or II vapor retarder.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222586	2/16/2018
222587	Michael Barriere (BarrierEnergy Inc.)	I vigorously oppose removing HERS Raters from the process of certifying PV Solar installations. Most installers still have no idea about verifying the output of the systems they install - NSHP not withstanding. This is a vital service for them, the property owner, the industry, and I presume the State. We discover not only typical mistakes like output not matching that promised, but have also discovered discrepancies and even safety issues. As was envisioned from the beginning, owners and lessees of such installed systems invariably appreciate having an independent 3rd party evaluate their system.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222587	2/16/2018
222591	Hwakong Cheng (Taylor Engineering)	The wording of section 140.9(c)4 is awkward because the subject of the sentence is “laboratories” but really should be “fume hoods”. Sashes and automatic sash closure systems are components of fume hoods, not of the laboratory rooms. Also, we recommend clarifying the requirement to apply to hoods that only have vertical sashes to make clear that it does not apply to hoods with combination sashes. Consider revising the paragraph as follows for clarity: “4. Fume Hood Automatic Sash Closure. Variable air volume laboratory fume hoods that have vertical-only sashes and that are located in ~~F~~fume hood intensive laboratories, as described in Table 140.9-B, ~~with variable air volume laboratory fume hoods, and with vertical sashes s~~hall have an automatic sash closure	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222591	2/16/2018
222591	Hwakong Cheng (Taylor Engineering)	We are supportive of the change to require automatic sash closure systems (Section 140.9(c)4) as fume hoods are a very high energy-intensity end use and other potential measures do not, in our opinion, provide the same level of energy savings and safety benefit.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222591	2/16/2018

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222592	Hwakong Cheng (Taylor Engineering)	One critical exception to the proposed 120.1(c)3 revisions is missing, which allows the outdoor air rates to each space to be met with transfer air. This exception is not included in the 45-day language so, as written, the zone minimums in a VAV system would need to account for the outdoor air fraction in the supply air, in order to maintain the outdoor airflow rate (Vz) to each zone. We strongly recommend retaining the following language from the existing standard (with minor update in accordance with new air classifications in Section 120.1(g)): EXCEPTION to Section 120.1(c)3: Transfer air. The rate of outdoor air required by Section 120.1(c)3 may be provided with air transferred from other ventilated spaces if: A. Use of transfer air is in accordance with Section 120.1(g); and B. The outdoor air that is supplied to all spaces combined, is sufficient to meet the requirements of Section 120.1(c)3 for each space individually.	This was an oversight in writing the 45-day language: this exception was not intended to be deleted. Staff have therefore restored the Exception in the revised Express Terms, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	Our recommendation is to revise Table 120.1-A to list 0.15 cfm/ft2 for almost all occupancies (except 0.2 for retail, 0.4 for barbershops, etc,… per the current Table 120.1-A) and delete the separate DCV column, since that would no longer be needed. Spaces with high occupant densities would be addressed by 120.1(c)3.B and spaces that require DCV would just drop to the basic area-based rates. The existing 2016 mechanical ventilation language could mostly be reused with only a minor edit to achieve the same end result. This would largely keep the supply ventilation requirements unchanged from the 2016 versions, except to add more categories to Table 120.1-A to define air classes and define where occupied-standby mode is permitted (see language page 5 and 6).	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	Pleated 2" MERV 13 filters become fully loaded very quickly and add significant pressure drop. If not replaced frequently enough, they can also become a pollutant source. We recommend limiting the scope of this requirement to systems that provide outdoor air (as described in its title: "Outdoor Air Treatment") by changing 120.1(c)1 (see pages 4-5 for language).	Staff does not find that higher MERV filters become fully loaded more quickly than lower MERV filters; time to full load is generally a function of total surface area rather than MERV. Staff also notes that issues arising when filters are not replaced occur for all air filters regardless of MERV. Regarding limiting filtration to outdoor air, research by Laurence Berkely National Laboratory and California Air Resources Board has determined that MERV 13 filtration should be used on both outdoor air supply and on the return/recirculated airflow in space conditoning systems to eliminate the particulate contamination that enters the dwelling from outdoors (which can be through an unfiltered pathway, such as an open window) or is generated from sources inside the dwelling such as by kitchen cooking activities. Ref: Singer B, Delp W, Black D, Destaillats H, Walker I. Reducing In-Home Exposure to Air Pollution. 2016. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Staff therefore does not find it appropriate to limit the scope of these requirements in this way.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	Requiring MERV 13 filtration for purely recirculating systems is unfounded and impractical. The analogous requirement in section 120.1(b)1.A for high-rise residential buildings is similarly inappropriate. The proposed requirement for MERV 13 filtration for recirculating systems per 120.1(b)1.A.i should be deleted or adjusted to MERV 8 when there is no outdoor air. Section 120.1(b)1.A is also confusing as it is not clear how subparagraphs ii and iii are different (see language page 4).	Research by Laurence Berkely National Laboratory and California Air Resources Board has determined that MERV 13 filtration should be used on both outdoor air supply and on the return/recirculated airflow in space conditoning systems to eliminate the particulate contamination that enters the dwelling from outdoors or is generated from sources inside the dwelling such as by kitchen cooking activities. Ref: Singer B, Delp W, Black D, Destaillats H, Walker I. Reducing In-Home Exposure to Air Pollution. 2016. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Staff therefore does not find that deleting or adjusting the MERV requirement as suggested by the commenter would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018

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222592	Hwakong Cheng (Taylor Engineering)	Table 120.1-A includes a note "F" for Barbershop occupancies which allows for ventilation to be reduced to zero when the space is in occupied-standby mode. This is consistent with Standard 62.1, which currently allows occupied-standby mode for barbershops but it really should not. Occupied-standby mode is generally for spaces with "clean" air, which a barbershop is not. It is a mistake in 62.1. Given that Title 24 prohibits DCV in barbershops (exception 2 to 120.1(d)3), occupied-standby also should not be allowed. We recommend deleting the note "F" for Barbershop occupancies.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	Table 120.1-A should be simplified to list 0.15 cfm/ft2 for all occupancies, except those with historically higher area rates defined in the old table based on building component sources. Spaces with high occupant densities are covered by the occupant-based rate in 120.1(c)3.B. Making this change would keep the Title 24 ventilation approach consistent with the historical requirements and keep the requirement simple since only one area-based requirement would apply to almost all occupancies. It would also eliminate the need for a separate column in Table 120.1-A to define the DCV rates.	Staff finds that the change in the Express Terms aligns with ASHRAE 62.2, consistent with the stated goal of updating references to the ASHRAE ventilation standards (62.1 and 62.2) and aligning with the requirements of the most current versions of these standards. Staff also finds that Part 6 has historically been aligned with these standards. Staff does not find evidence in the record that 0.15 cfm/ft2 is appropriate for all occupancies; notably, occupancies such as beauty salons and barbershops may have low occupant densities but need high ventilation rates. Staff therefore does not find that losing the detail provided in the Table would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	Table 120.1-A specifies 1.07 cfm/ft2 for auditoriums, which equates to 14 ft2/p, or half of the occupant load in Table 1004.1.2 of the CBC. However, note "a" states that this rate assumes non-fixed seating using the occupant density assumption from 120.1(c)3. The current 2016 language defines the number of occupants as the greater of the design occupancy or half of the CBC occupant load for areas without fixed seating but the proposed 2019 language no longer includes that reference. This note would not be needed though if simply relying on occupant densities to be addressed in 120.1(c)3.B.	Staff has corrected the language of Note "a" (now General Note 1), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	There is an editorial mistake in 120.1(d)4.E. Consider revising to: E. When the system is operating during hours of expected occupancy, the controls shall maintain system outdoor air ventilation rates no less than the rate listed in TABLE 120.1-A for DCV, times the conditioned floor area…	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222592	Hwakong Cheng (Taylor Engineering)	There is an editorial mistake in 120.1(d)5.A. Consider revising to: A. Occupant sensors shall meet the requirements in Section 110.9(b)4 and shall have suitable coverage and placement to detect occupants in the entire space ventilated. If o~~O~~ccupant sensors controlling lighting are~~may~~ be used for ventilation, ~~as long as~~ the ventilation signal shall be~~is~~ independent of daylighting,manual lighting overrides or manual control of lighting.	Staff has revised the language of this Section consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222592	2/16/2018
222594	Curt Rich (NAIMA)	Adopt editorial changes to RA3.5 Quality Installation Procedures for improved clarity. The clarity of two items contained in RA3.5 could be improved through language changes and diagrams. There is a precedent for diagrams within the residential appendices and for the scenarios discussed it would greatly improve the usability and clarify the intent (see suggested language pages 3-4).	Staff has rephrased the section's requirements and added diagrams, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222594	2/20/2018

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222594	Curt Rich (NAIMA)	Maintain consistency within Section 150.0(c)2 requirements and list both R-value and U-factor for mandatory minimum wall insulation requirements. All home insulation products are capable of meeting R-20 in 2x6 wall cavities, including cellulose, fiber glass, mineral wool, open cell spray foam, and closed cell spray foam. The labeled R-value of insulation products are easy to identify and generally understood by the general public as to what they are getting. requiring builders and inspectors to turn to a separate U-value chart either in or outside of the code to determine compliance further complicates the code and is bad public policy. With no explicit need to remove the listed R-value requirement, NAIMA strongly recommends that the format be maintained for the 2019 Title 24, Part 6, Building Energy Efficiency Standards.	Section 150.0(c) has been modified and will continue to report R-values and U-factors (though as separate line items), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222594	2/20/2018
222595	Arnold Wilkenss (University of Essex)	Comments on NEMA77, SVM and Philips request. Comment letter is a response to comments by NEMA/SVM/Phillips regarding support for changes in the proposed Standards. Does not appear to be commenting directly on the proposed Standards, but is a rebuttal to other stakeholders.	Staff notes that NEMA 77 was not included in the Express Terms owing to similar concerns voiced during the pre-rulemaking proceeding. Staff appreciates the additional information provided by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222595	2/17/2018
222596	Hwakong Cheng (Taylor Engineering)	A wind tunnel study is based on a static condition of the building and its surroundings. If the surroundings change after the fact (e.g. a new building constructed downwind by a different building owner), the plume dispersion may be impacted and new sensitive receptors may be introduced resulting in unsafe conditions. This is a significant safety risk that would be outside of the scope of the Title 24 requirement. Though the same risk could apply for a conventionally operated stack maintaining 3000 fpm exit velocity, this measure exacerbates the risk by constantly reducing the stack velocity and reducing the effective plume height. Plume dispersion analysis and wind responsive control are both potentially very good energy efficiency measures but they require an informed and responsible building owner to ensure effective and safe operation over the long term – it is not universally appropriate and should not be incorporated as a minimum code requirement.	As the commenter mentioned, these factors are outside the scope of the Energy Standards and these arguments would apply to any lab exhaust system; staff notes that Part 6 is not a complete specification of all aspects or requirements for such systems, but only specifies requirements that ensure energy efficiency (and does so in a way that comports with requirements outside of Part 6). That said, staff has added language to except systems where health and safety requirements would cause the efficiency requirements to not be appropriate, consistent with the commenter's concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	Modifying the designs from these non-compliant exhaust systems would add significant cost that is not represented in the CASE report. (see table page 4) Section 5.3 of the CASE report describes an overly simplistic cost exercise that does not reflect the true incremental first cost of this requirement. (see analysis pages 4-6)	Staff finds that the commenter misunderstands the specified requirements: the requirements of this section are only applicable to newly installed exhaust systems, and thus would not cause existing systems to be modified.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	Sections 140.9(c)3.C and 140.9(c)3.D refer to maintaining “downwind concentrations below health and odor limits for all detectable contaminants”. The “health and odor limits” must be based on a specific reference to be meaningful. The word “detectable” should be deleted – that effectively means that the controls do not need to address contaminants that are not detectable.	Staff has added reference to "health and odor limits, as defined by the 2018 American Conference of Governmental Industrial Hygienists Threshold Limit Values and Biological Exposure Indices", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The control integration cost of $2500 for wind responsive control also appears unrealistically low. Section 3.2 suggests that periodic calibration is required for safety, but yet that cost is not included in Section 5.4 on incremental maintenance costs.	Staff notes that 140.9(c)3C is an alternative to 140.9(c)3B: 140.9(c)3B provides a cost effective compliance path, and 140.9(c)3C simply recognizes that this additional method also provides the same benefit. This alternative option is not required to demonstrate cost effectiveness given that compliance via 140.9(c)3B is available for those situations where it is not cost effective or not otherwise preferred.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.A adds a requirement for laboratory exhaust to comply with the discharge requirements in ANSI Z9.5-2012. These requirements relate to safety and generally align with common industry standard of care. Nevertheless, the reference does not relate to energy use and is not appropriate to be included in the building energy efficiency standards and should be deleted.	Staff finds that ANSI Z9.5-2012 is an industry accepted source of best practices for lab exhaust system design, and that ensuring that system safety is not adversely affected by pursuit of energy efficiency by establishing a standard consistent with this safety protocol is fully appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.B sets a single threshold fan power limit of 0.65 W/cfm for any new lab exhaust system greater than 10,000 cfm. Though this limit has been relaxed from the originally proposed 0.45 W/cfm, this threshold may still be impractical to achieve in practice for many laboratory exhaust systems. A survey of more than a dozen laboratory exhausts with utility set fans and conventional exhaust stacks show that the majority would exceed this limit, and many by a large margin.	Staff amended the limit to 0.85 W/cfm for systems with air-filtration devices and added an exception for systems where code required air filtration devices create a design static pressure drop greater than 1 in. water, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.C analysis does not include the cost for a wind tunnel study, which can range from $30,000 to $50,000 (on the higher end if including wind-responsive control and there is no pre-existing model for surround terrain/buildings, which is likely for prescriptive compliance projects), by the rationale that it is a design cost. This is not a reasonable justification to ignore such a significant first cost that would not otherwise be needed.	Staff does not find, and the commenter does not specify, in what way the proposed standards would compel a wind tunnel study that would not otherwise be performed. Staff therefore does not find that a new or marginal wind tunnel study is made necessary by the standard proposed for inclusion in Part 6, and that the cost noted by the commenter would be extraneous to compliance with Part 6. (Staff additionally notes that the retail price of models currently available on the market would already reflect the need to pass-through their design costs, and that double-counting of these costs would not be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.C analysis first costs also do not include variable speed drives on the exhaust fans by the explanation that they are already required by code. There is no such requirement in T24 for variable speed process exhaust fans. Section 140.9(c) requires variable flow in some cases, but most laboratory exhaust fans operate at a fixed speed with makeup bypass damper to maintain discharge requirements. And most lab exhausts have two fans for redundancy so the cost of two variable speed drives should be included.	Staff notes that 140.9(c)3C is an alternative to 140.9(c)3B: 140.9(c)3B provides a cost effective compliance path, and 140.9(c)3C simply recognizes that this additional method also provides the same benefit. This alternative option is not required to demonstrate cost effectiveness given that compliance via 140.9(c)3B is available for those situations where it is not cost effective or not otherwise preferred.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.C provides an alternative compliance option to use wind responsive control. Though this can potentially be a very cost effective measure, the energy savings are strongly dependent on local wind conditions, the relative location of downwind receptors, and the amount of turndown in exhaust demand. An exhaust stack with a taller building in the predominant downwind direction may not be able to achieve any setback. Stacks in high wind areas may also have more limited opportunity for turndown. Many labs are also designed with constant minimum ACH rates that may not allow for 40% turndown in exhaust airflow. The energy cost savings presented in the CASE Report present an optimistic case which may not be broadly applicable.	Staff notes that 140.9(c)3C is an alternative to 140.9(c)3B: 140.9(c)3B provides a cost effective compliance path, and 140.9(c)3C simply recognizes that this additional method also provides the same benefit. This alternative option is not required to demonstrate cost effectiveness given that compliance via 140.9(c)3B is available for those situations where it is not cost effective or not otherwise preferred.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.C would require use of an aggressive energy saving measure that may pose an unacceptable safety risk for several reasons. The CASE Report suggests that wind responsive control is safe as long as there is periodic calibration. Relying on sensor calibration to maintain public safety is a big leap of faith, particularly considering that preventative maintenance and manufacturer-recommended sensor calibration intervals are nearly universally neglected by facility operators, often due to lack of resources and knowledge. Though the proposed requirement includes a safety in the case of sensor or communication failure, it does not address sensor drift or fouling (i.e. bird poop). Since the anemometer accuracy is critical for safety, a common approach is to install two anemometers so that the readings can be compared.	Staff has added requirements that address the safety concerns outlined by the commenter, including: ~Paired wind / chemical sensors (per the commenter's suggestion) ~Failsafe method to detect a failed sensor and expired sensor calibration. ~Requirement for Energy Management Control System or other fault management system notification in case of failed sensor. These compliment the requirement that the system revert to a worst case wind or chemical discharge level of operation when a system fault is detected.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	The proposed Section 140.9(c)3.D would require use of contaminant sensing to allow for reduction in exhaust fan power when no hazards are detected. This commercial product utilizes a photoionization detector, which is only capable of detecting volatile organic compounds. This approach CANNOT detect many hazardous laboratory chemicals, including acid fumes, particulates, and radioisotopes. It is not uncommon for laboratory research interests to change over time, chemicals used in a lab today may differ significantly from those used in the future. Use of such a system requires a diligent and effective laboratory safety manager that tracks and limits chemical usage and understands the limitations of the contaminant sensing system. In our professional opinion, reliance on a contaminant sensing system to save fan energy poses an unacceptable compromise in safety – we will not ever employ such a system in our designs and do not think it is appropriate to be made a minimum code requirement.	Staff notes that 140.9(c)3D is an alternative to 140.9(c)3B: 140.9(c)3B provides a cost effective compliance path, and 140.9(c)3D simply recognizes that this additional method also provides the same benefit in associated circumstances. Staff fully expects the choice of option to be driven by the needs of the project in question, and that decisions regarding health, safety, and efficacy may cause this specific option not to be appropriate for a given project (noting that there are projects that take this approach and find it to be appropriate for their needs). In providing this option, Part 6 is only specifying that *when* this approach is chosen, it is required to be deployed in an efficient configuration. Staff finds that Part 6 is agnostic between available approaches and does not serve to imply either that all approaches are equally appropriate for all projects or to recommend a specific option for projects.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	There is a spelling mistake in section 140.9(c)3.C.iii. Please revise as follows: “Wind speed/direction sensors shall be certified by the manufacturer to be accurate…”	Staff has corrected the noted spelling error.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018
222596	Hwakong Cheng (Taylor Engineering)	We have strong concerns that the proposed requirements in Section 140.9(c)3 are inappropriate for the energy code, impractical, not cost effective, and/or pose unacceptable safety risks. We recommend revising the language to: 3. Fan System Power Consumption. All newly installed fan exhaust systems serving a laboratory or factory greater than 10,000 CFM shall comply with the requirements of 140.4(c).	Staff finds that the proposed measures have the opportunity to save large amounts of energy, have been shown to be cost effective in the CASE report, and do not require actions that increase safety risk when best engineering practices and applicable codes are followed.To the extent that the commenter is recommending changing to a 140.4(c) (ASHRAE 90.1) based efficacy metric as a superior alternative to the proposed, staff invites the commenter to submit a complete code change proposal (including detailed analysis of the differences in standards) for the 2022 rulemaking proceeding. Staff otherwise finds that the current approach is fully justified based on the data and information provided to the rulemaking record.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222596	2/16/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222606	Dave Bannister (AccurIC)	SVM is no substitute for the current JA8 procedure. The procedure outlined in the current JA8 is designed in accordance with one of the inescapable conclusions of the research-base as a whole, and which also underpins IEEE Std 1789. Namely, that different effects of flicker (stroboscopic effect, phantomarrays, headache, eyestrain, etc) are prevalent over different frequency-bands. By contrast, SVM considers only the stroboscopic effect. Even a value of SVM=1.0 (the lowest value discussed by its proponents) would allow levels of stroboscopic flicker that are detectable by half the population, whilst neglecting/ignoring other flicker effects. A value of SVM=1.6 would therefore allow levels of stroboscopic effect that are detectable by a clear majority of the population, whilst again neglecting/ignoring other flicker effects (which would then, of course, be greater, in line with the increased value of SVM). Much of the criticism of IEEE Std 1789 is founded on misconception and the erroneous interpretation of the research-base, both in terms of the metrics deployed and the effects under investigation	Staff is not proposing inclusion of NEMA 77 in the Express Terms, owing to this and similar concerns expressed by commenters. Staff appreciates the additional information provided by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222606	2/20/2018
222607	Bing Guerin (Green Dinosaur)	I would like to expressing strong opposition to the CEC's proposal to remove HERS verification of Solar V systems, especially since the CASE report on Solar PV supported HERS verification of PV as a required energy measure. As currently written, the CEC assumes that resource strained building departments will take on the complicated and time consuming verification of PV. This work should be completed by HERS Raters. HERS Raters have specialized solar training that building department inspectors do not have. Plus, since a HERS Rater is already required on newly constructed homes, the cost to add the HERS inspection is small compared to the benefit of ensuring proper installation of the PV system.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222607	2/20/2018
222609	Robert Pollock	California's new code only applies to conventional stick frame buildings and sometimesnegatively impacts the options for alternative designs. All the "Ranch style", shoe box bungalows, covered on the outside with heat islanding stucco/concrete are "inside out". New insulation should be continuous and applied to the outside of the building, not retrofitted tediously from the inside as this new code would have one do. I see conflicts right away because the Passive Haus code considers the site carefully, and the California code, not at all.	Staff finds that the commenter is incorrect in their understanding of current and proposed code requirements; the commenter seems to believe that in an alteration or addition he would have to bring the walls up to current code by adding continuous insulation to the inside, which is not the case as there are existing Exceptions to continuous insulation requirements that apply in the noted cases. Staff therefore finds that the language as proposed already addresses the commenter's concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222609	2/20/2018
222610	Shane Hansen (Green Dinosaur)	I would like to express strong opposition to the CEC's proposal to remove HERS verification of Solar PV systems, especially since the CASE report on Solar PV Raters have specialized solar training that building department inspectors do not have. Plus, since a HERS Rater is already required on newly constructed homes.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222610	2/20/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222613	Michael Jouaneh (Lutron)	The commenter support moving the Title 20 lighting controls requirements for self-contained lighting controls into Section 110.9 provided that the requirements are removed from Title 20 so that there are no inconsistencies.	Staff appreciates the comment of support. Staff will coordinate internally with the Appliances team to make appropriate, matching changes to Title 20.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	2/20/2018
222613	Michael Jouaneh (Lutron)	"OpenADR 2.0a or later" should be compliant instead of specifying version 2.0a or 2.0b. In other words, when OpenADR 3.0 comes out, VENs that support 3.0 should be acceptable for compliance. (see language page 4)	Regulations cannot be speculative: by law, regulations must be complete when they are evaluated by the public and the adopting agency, and cannot be subject to change due to actions that occur outside of a rulemaking proceeding. Therefore, regulations cannot specify adhering to the "current" or "latest" version of a document, as otherwise a change in such a document would become law automatically and without review by either the public or by lawmakers with authority to make changes to regulation. Staff therefore finds that making the change suggested by the commenter would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	2/20/2018
222613	Michael Jouaneh (Lutron)	Most importantly, after receiving the ADR signal, the lighting power should actually change (not just be capable of changing) from the current lighting power consumption. That is, if the lights are already at 85% of total installed power, they should be further reduced. The total percentage change would be negotiated between utilities and their customers. Also, the second sentence that starts with "for compliance" should be removed as it is already covered in the acceptance testing requirements. The sentence also causes confusion as most think this is the requirement, not just guidance on acceptance testing. Thus, we urge the Commission to strike it. (see language page 4)	Staff has revised the phrasing of this provision for clarity and, in doing so, separated it into its own subsection. The "capable of" phrasing is removed, consistent with the commenter's suggestion. Staff notes that acceptance test procedures specify setting lighting to its full-on mode for the test, and thus that the commenter's concern about dimmed lighting is moot. Staff finds that striking the provision entirely would create ambiguity regarding what is minimally required for demand responsive lighting controls, and therefore does not find that doing so would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	2/20/2018
222613	Michael Jouaneh (Lutron)	Most lighting systems currently don't have OpenADR natively as part of the system. The language should explicitly state that a VEN must be installed that can receive an OpenADR signal and can communicate with the lighting system using any protocol downstream of the VEN. Do not specify the protocols that the demand responsive systems must use within the building. (see language page 4)	Staff has rephrased this requirement to remove the phrase "that occur within the building" and have added a new Section to expressly state that additional protocols may be used, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	2/20/2018
222613	Michael Jouaneh (Lutron)	The demand responsive controls themselves are not VENs, but they should have a way to communicate with an OpenADR compliant VEN. (see language page 4)	Staff has added Section 120.12(a)1B to allow cloud-based VENs, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	2/20/2018
222613	Michael Jouaneh (Lutron)	1. Strike the word "relamping" from the section as it does not apply to LED lighting. Section 130.0(c)1A and 1B 2. Add the phrase "luminaire as specified in Section 130.0(c)1" to Section 130.0(c)4. 3. Add the phrase "luminaire as specified in Section 130.0(c)1" to Section 130.0(c)5.	1. Staff has rephrased this Section to cover both conventional and LED lighting technologies, consistent with the commenter's suggestion. 2. Staff has added the recommended phrase to improve the clarity of the Section's requirements. 3. The requirement of Section 130.1(c)1 applies to luminaires for luminaire labeling; LED tape lighting and similar products are manufacturered in a narrow form that makes it infeasible to affix legible luminaire-style labeling, and additionally often allow the tape to be cut into arbitrary lengths such that the factory cannot know, and thus cannot mark, the total final power of a given installed strip. For this reason, staff is intentional in not proposing that the marking requirements of Section 130.0(c)1 apply to LED tape lights covered by 130.0(c)5.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	Lighting level should be reduced not increased during a demand response event in order to ensure energy savings. Also, Section 110.12 states that lighting must be reduced during a demand response event. Strike the word "increase". Section 130.1(f)	Staff has removed the phrase "increase or decrease" and instead specified "adjust" in this Section. Staff notes that the purpose of this Section is solely to ensure that all installed controls "play nice" with one another, and not to specify what functions or behaviors any particular control possesses; staff finds that general phrasing is necessary here to avoid inadvertently prohibiting advanced demand responsive or grid interactive behaviors or features.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	Modify the receptable alteration requirements so that to increase energy savings and to align with ASHRAE 90.1. For alterations, require new receptacles added to the space listed in Section 130.5(d) to compy with Section 130.5(d).	Staff finds that adding a requirement to install contorlled receptacles in alteration projects would impose additional costs that are not described in the record; a complete code change proposal including a description of costs and benefits would be needed in order for the Commission to consider doing so. Staff therefore invites the commenter to complete a Code Change Proposal for this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222613	Michael Jouaneh (Lutron)	1. All occupancy and vacancy sensors "provide automatic off functionality", so this phrase is not needed in the Express Term language of Section 150.0(k)2I. 2. For increased energy savings, occupancy sensors should be initiall configured to either partial-on or manual-on operation. The commenter suggested changes to the Express Term language to allow both partial-on or manual operation for occupancy sensors. (Section 150.0(k)2I)	1. Staff notes that the definition of "occupancy sensor" specifies that it may either turn lighting down or off; staff therefore finds that specifying off, rather than down, is necessary. 2. Staff has added language to specify that the initial configuration shall be in manual-on mode, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	The Commission is missing a large energy saving opportunity by not requirining lighting controls for permanent hard-wired outdoor lighting that is not attached to a building (single family). Section 150.0(k)3	Staff finds that a complete code change proposal describing the costs and benefits of imposing requirements on currently unregulated residential outdoor lighting would be needed in order to consider this suggestion, and adds that any such proposal will also need to address issues of regulatory scope. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	1. Change the test criteria for JA8 light sources with fade-in features from the ENERGY STAR memo to the ENERGY STAR Start Time Test Method. 2. Remove the proposed test for light sources with a standby mode because there is no established test method and guesses on how to do it are inconsistent. Consumer experience will be different than lab conditions. JA8.3.3	1. Staff has updated references to ENERGY STAR tests, consistent with the commenter's suggestion. 2. Staff finds that the provision is necessary to address questions of digitally-controlled lighting that may remain in an "off-like" standby move when listening for control signals: devices consuming less than 0.2 watts of power in this state are effectively off, and can be treated as such. Otherwise, there is a risk of fully prohibiting some forms of digital controls due to non-zero (but near zero) power consumption being considered a standby state rather than an off state.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	Strike the luminous efficacy requirement of Section JA8.4.1 as it belongs to Title 20 Appliance Efficiency Regulations.	Staff finds that the scope of application of Part 6 and JA8 extends to a far broader set of lighting devices than are currently subject to appliance standards under Title 20. Staff therefore does not find that striking these requirements would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	The Commission should allow for 5000K Correlated Color Temperature (CCT) light sources to give consumers the choice of cooler lighting in certain applications, such as utility rooms, garages, and laundry rooms.	Staff is not proposing any change to existing color temperature requirements as a part of the 2019 rulemaking. That said, staff notes that the intent of the current requirement is to apply universally and avoid situations where requirements change based on how a room is named or labeled on plans. As regulatory language needs to be explicit and comprehensive with regards to the applications and rooms that are and are not subject to a provision, staff finds that this suggestion would be best addressed via a complete code change proposal that provides a level of detail necessary for consideration by stakeholders and lawmakers. Staff therefore does not find that creating a provision of this type within this rulemaking would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	1. Delete "as type 1 or type 2 product" from the reference to NEMA 7A-2015. 2. Cite the latest NEMA SSL 7A document. 3.Strike JA10 and replace it with NEMA 77-2017.	1. Staff has revised the language of this Section consistent with the commenter's suggestion. 2. Staff has updated the reference to this document consistent with the commenter's suggestion. 3. Staff does not find that NEMA 77 provides the same assurances that are provided by JA10, and commenters have raised several concerns with regards to its use. Staff therefore does not find that replacing JA10 with NEMA 77 to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222613	Michael Jouaneh (Lutron)	Make the appropriate changes to Table JA-8 per comments in Lutron's letter about efficacy, CCT, and JA10.	Staff has updated this Table to retain consistency with other changes proposed for JA8.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222613	
222614	Shawn Mullins (Owens Corning)	Owens Corning does not support removing the R-value references as we believe this terminology provides directional information to the builders and design community regarding baseline expectations.	Section 150.0(c) has been modified and will continue to report R-values and U-factors (as separate line items), consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	Regarding the difficulty of Open Cell Polyurethane Spray Foam (OCSPF) manufacturers not being able to meet a R20 cavity thermal value. We believe this to be incorrect as the table below demonstrates several OCSPF manufacturers have products that meet the R20 thermal value in a 2x6 wall.	Staff appreciates the additional data provided by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	Supports the North American Insulation Manufacturers Association's comments posted to the Docket on 2/20/2018.	Staff's responses to NAIMA's comments are shown in this document.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We could perfer the Commission reconsider: Clarify the reasoning behind why multifamily language did not follow relative to upgrading the Prescriptive wall assembly U-factor to 0.048.	Staff notes that the CASE report includes the following explanation: "Because of unique challenges experienced in multifamily construction this building type has been excluded from the proposal." Staff's proposed language is consistent with this exclusion in the supporting data.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We support prescriptive below deck roof insulation increased to R19 from R13.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222614	Shawn Mullins (Owens Corning)	We support prescriptive wall U-factor at 0.048 (R21+R5) from 0.051 (CZ dependent and SF only).	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We support Quality Insulation Installation (QII) as a prescriptive measure.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We support the decision to maintain previous recommendations to eliminate the PV Solar trade-off credit against high performance walls, high performance attics and energy efficiency measures in general.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We support the R20 Mandatory Feature for 2x6 walls as written.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We support the requirements for HERS Verified Whole House Fan performance metrics.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We would prefer the Commission reconsider adopting new PV Solar + Battery Storage credits which offset the High Performance Wall (HPW) and High Performance Attic (HPA) requirements and further compromise the building envelope. we strongly encourage the Commission to provide some framework as to what these credits may look like, and to do so ahead of adopting the 2019 Standards. Waiting until Alternative Calculation Methods Manual updates does not provide sufficient opportunity for stakeholders to adequately evaluate the impact of potential compliance changes. We also believe that providing some framework regarding any credits under consideration during the 45-day language review process is in line with statements made by the Commission at the recent hearings around improving transparency. Stakeholders would benefit greatly from at least some documented directional language regarding expectations of any credits under consideration.	Staff are proposing compliance credit for battery storage systems consistent with the framework used in 2016 for solar photovoltaics and consistent with the commenter's comments. Staff finds that extending the 2016 credit for solar PV or adopting a new compliance credit for PV would not be appropriate, as PV is no longer optional for a building but is a prescriptive requirement, therefore the base inclusion of a solar PV system is already assumed. Staff does not find that providing compliance credit for additional PV capacity installed in excess of the building's anticipated electrical load to be appropriate, as this would allow a decrease in building efficiency that would increase energy demand, including energy demanded during times where the solar PV system is not generating energy (thereby increasing the consumption of energy generated using non-renewable sources).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222614	Shawn Mullins (Owens Corning)	We would prefer the Commission reconsider include Mandatory Features for 2x4 walls remaining at R13 vs. elevating to R15.	Staff finds that the move from R-13 to R-15 mandatory minimum wall insulation for 2x4 framing was not shown to be cost-effective in all climate zones.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222614	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We recommend that an informative note be added to Section 100.0 for clarity of removal of the devices references and requirements from Part 6, as users may be familiar with one but not both Title 20 and Title 24. (Section 100.0)	Staff finds that a longer explanation, such as would be needed here, is more appropriately provided in the Compliance Manuals. Staff therefore did not find that adding an informative note on the relationship of T24 and T20 lighting control requirements to this Section would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We recommend that Title 24 Part 6 adopt the ANSI definition of solid-state driver instead of the definition of RP-16 because the ANSI definition is referenced within an official Standard, ANSI C82.16-2015, whereas RP-16 is a IES Recommended Practice. (Section 100.1)	Staff finds that the suggested ANSI defintion may confuse readers/users by implying that DC drivers are not allowed, as the ANSI defintion seems to suggest a frequency of 50 to 60 Hz. Given that Title 24 allows both AC and DC drivers to be used to comply with Title 24 requirements and the suggested defintion could be read as preventing the use of DC drivers, staff does not find that use of the ANSI definition would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We support the proposed changes in Section 110.9 that remove lighting control devices references and requirements from Building Energy Efficiency Standards. (Section 110.9)	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222615	Kelly Seeger (Philips Lighting)	We oppose the language in Section 130.0(c)6 because it does not address smart building technology, and IoT and connectivity conditions that will likely be mainstream by 2020. Modular lighting systems such as Power over Ethernet (PoE) systems in many cases are not a dedicated power supply and may power more than lighting. We recommend to adopt a new proposed ASHRAE 90.1 language (Addendum AH) which is presently out for public review. (Section 130.0(c) 6)	Staff has added an Exception to Section 130.0(c)6 for power-over-Ethernet systems supplying power for installed non-lighting devices. Staff finds that emerging smart building technologies can, once matured, make use of the 10-109 process for alternate component packages and exceptional methods. Staff finds that the changes to broaden and simplify the verbiage in Section 130.0(c)6 both better address the majority of modular lighting systems and set a better stage for consideration of new technologies under 10-109. Staff does not find that adopting more speculative language, including the non-final language referred to by the commenter, would be appropriate; staff awaits finalization of ASHRAE 90.1 so that it may be considered in the next update to the Standards.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We support the changes and suggest some minor changes to wordings in Section 130.1(f) to further clarify the language. 1. Replace the phrase "increase or decrease" with "adjust. (Section 130.1(f)4) 2. Add the phrase "to allow for user preference" to the end. (Section 130.1(f)5) 3. Replace "that provide an automatic on function" with "that turn the lighting on automatically". Replace "is capable of automatically activating between" with "that allows activation of". (Section 130.1(f)6)	Staff appreciates the comment of support, and welcomes suggestions that can improve and clarify the language of the Standards. 1. Staff has replaced the phrase "increase or decrease" with the word "adjust" as suggested by the commenter. 2. Staff finds that the phrase "to allow for user preference" does not have a regulatory effect, and would imply that other reasons for configuring controls may not be permitted (which is not the intent of this Section). Staff therefore does not find that adding this phrase would be appropriate. 3. Staff finds that the change in phrasing from "that provide[s] an automatic-on functon" to "that turn[s] the lighting on automatically" would have the effect of restricting the provision to applying only while an automatic-on function is engaged, not merely while it is available. Staff also finds that use of the "is capable of" phrasing allows the control to be configurable outside of the specified 50-70 percent range provided that it could also be configured within that range; specifying that the control must "allow activation of" that percent could be read more restrictively, and it is not the intent of this Section to limit the ability to configure installed controls. Staff therefore finds that making the suggested replacement would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We oppose the proposed reduction to the exemption for luminaire cutoff requirements and the change in limits from power (watt) to luminous flux (lumens). 1. This change would place undue hardship on our outdoor products teams by requiring review of each and every photometric package against the BUG ratings of Title 24. 2. Due to the complex relationship between input power and luminous flux there may be products that may be disallowed by this requirement, thus unintentionally limiting the choices of architects and lighting designers. (Section 130.2(b))	1. Staff finds that the proposed exemption does not increase work to review photometric information. Both existing and proposed exemptions related to the compliance with the IES BUG rating are based on a single threshold value, and even though there is a change of metric from wattage to lumen, both value are basic information for lighting design (i.e., they are both pieces of standard information provided by luminaire manufacturers for lighting design use). Photometric information is routinely prepared by manufactures for lighting design use; staff finds that the effort of compliance for lighting manufacturers is about the same for the existing and proposed requirement for the BUG rating, and does not find that a hardship is created. (Staff notes that for lighting manfacturers who provide the BUG rating informaton in addition to the photometric information, the same BUG rating information can be used for the determination in meeting the BUG rating requirements. For other manufacturers who choose not to include the BUG rating information, lighting designers can determine the BUG rating with the luminare photometric information that is routinely prepared and provided by manufacturers.) 2. The proposed metric of lumen output is appropriate for the BUG requirement as lumen output is a luminous metric. On the other hand, the existing metric of luminaire wattage is not a luminous metric. Since the luminaire cutoff requirement of the Energy Code is to ensure light generated from the luminaire is distributed to where they shoud be without causing glare, sky glow (uplight) and light trepass (CalGreen regulations), a lumen-based metric is more directly related to the light generated from the luminaire. Staff therefore finds that the change to a luminous metric is fully appropriate, as it is not the intent of the Standards to allow products to cause increasing levels of glare, glow, and trespass as lumens-per-watt efficiency improves.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We think the importance of both wattage limits and area limits for occupancy-based controls will decline as the market moves beyond traditional control installations and toward networked, site-wide outdoor lighting controls. The control requirements already in place within the code ensure energy savings levels. (Section 130.2(c))	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222615	Kelly Seeger (Philips Lighting)	1. We oppose an aperture size limits for the additional lighting power allowance because tunable-white and dim-to-warm luminaires are available now in many shapes, sizes and form factors. Small aperture does not accurately describe or classify tunable-white and dim-to-warm luminaires. 2. We encourage the Commission to broaden the allowed space types for the proposed power allowance for tunable-white and dim-to-warm luminaires. We believe there is solid support for broad application, as part of dynamic interior environments - they are engaging healthy spaces that increases occupant comfort and wellbeing. (Section 140.6(a)4)	1. There is no proposed limitation for the use of any specific form factor of tunable-white and dim-to-warm luminaires: there is a proposed "adjusted indoor lighting power" for small aperture tunable-white and dim-to-warm luminaires, essentially providing a small, additional allowance in limited cases. This adjustment is provided as the CASE measure analysis shows that small aperture color-tuning luminaires (including dim-to-warm luminaires) use more power than similar form-factor static color luminaires. The CASE analysis supporting this adjustment is of limited scope and reviews small-aperture tunable-white and dim-to-warm luminaires only, thus the proposed "adjusted indoor lighting power" is necessarily limited; staff invites the commenter to submit a similar analysis and proposal in the next (2022) rulemaking, so that similar adjustments for additional form factors can be considered. 2. Staff notes that tunable-white and dim-to-warm products are allowed in all spaces: the lighting power budgets specified in the prescriptive requirements are feature agnostic, and while these products do tend to be more power consumptive than static products staff does not find that the difference is great enough to disallow their prescriptive use. That said, staff invites the commenter to submit a complete code change proposal containing an analysis of these products such that appropriate, additional adjustments can be identified and considered.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We support the language that permits the user to select a reasonably equivalent space type if the primary function area type is not listed in Table 140.6-C. We recommend the alignment of this language with ASHRAE 90.1-2016. (Section 140.6(c)2A)	Staff appreciates the comment of support, and finds that the Express Term language is closely and approriatley aligned to the ASHRAE language, which reads, "For space types not listed, selection of a reasonable equivalent category shall be permitted". The Express Term uses the term "primary function area", as in comparison to the ASHRAE term, "space type", for consistency with the rest of Section 140.6(c) as well as with several related definitions in Section 100.1. Staff therefore finds that using the phrase "space type" would be more ambiguous as well as inconsistent with Section 140.6(c), and therefore would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We commend the Commission's decision to rewrite the language for lighting alterations. (Section 141.0)	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We thank the Commission for its decision to remove the proposed mandate of a correlated color temperature of 3500K in low-rise residential applications. (Section 150.0(k))	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	1. We suggest that "nominal rated wattage" be changed to "rated wattage" for clarity and alignment with common usage of the terms by industry. 2. We recommend the Commission to align the power factor requirements in JA8 with those of ENERGY STAR for clarity and consistency. (JA 8.4.2)	1. The phrase "nominal rated wattage" is not used in this Section; staff therefore finds that no change is necessary. (Staff notes that the word "nominal" is only used in JA8 with regards to correlated color temperature.) 2. Staff finds that this change would represent a substative decrease in stringency and increase in energy demand; staff therefore does not find that this change would be appropriate absent a complete analysis of its effects.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We oppose the mandate of CRI 90 and R9 of 50 for all low-rise residential applications. (JA8.4.4)	No change is proposed to the CRI 90 and R9 of 50 requirement for low-rise residential applications; staff notes that the justifications for these values are documented in the prior rulemaking proceedings under which they were adopted. Staff is not reopening a discussion of these values as a part of this rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We recommend NEMA 77 as a method for qualifying products to Title 24 JA8. Use of NEMA 77 should be considered a strengthening of the requirements for temporal light artifact, not weakening. (JA8.4.6)	Staff is not proposing inclusion of NEMA 77 as a part of this rulemaking, in part due to comments raising concerns with regards to its use. To the extent that the commenter feels they can fully address the concerns raised, staff invites the commenter to submit a complete code change proposal for consideration in the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222615	Kelly Seeger (Philips Lighting)	We commend the Commission's decision to remove the elevated temperature test from JA8.3.6 in favor of alignment with ENERGY STAR. (JA8.5)	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222615	2/20/2018
222616	Cori Jackson (California Energy Alliance)	Assuming the 70-luminaire loophole is addressed and reduced per the CEA's recommendations, the CEA supports the revised lighting control requirements contained in Section 141.0(b)2.I, as detailed under Table 141.0-E Control Requirements for Indoor Lighting System Alterations.	Staff appreciates the comment of support; staff notes that the luminaire threshold is not a "loophole" but is a minimum value necessary to ensure that the number of controlled luminaires is not so few that the controls are unable to save energy commensurate with their costs. While staff have revised the threshold value, staff notes that the statutory requirement for cost effectiveness still applies and that it is inaccurate to characterize thresholds determined to be necessary for compliance with statute as "loopholes".	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222616	2/20/2018
222616	Cori Jackson (California Energy Alliance)	Generally, the CEA supports the proposed language and believes the language is shorter, simpler to understand, and will improve compliance and energy savings for California.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222616	2/20/2018

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222616	Cori Jackson (California Energy Alliance)	The CEA does not support continued inclusion of a 70-luminaire exemption per building floor, per year, for one-for-one luminaire alterations (Exception 6 to Section 141.0(b)2I). The CEA asks that the Energy Commission revisit the CEA's code change proposal, and reference the CEA's documentation regarding reducing this exemption to 50 luminaires or less.	Staff has revised this threshold consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222616	2/20/2018
222619	Charles Knuffke (Legrand)	§110.12(a)1 and 2: We believe that while the CEC should describe the functional ability of ADR, it should not specify the location where communication should happen, or specific methods used to achieve the desired result.	Staff has revised the language in this Section to allow for manufacturer certification of the capability of communication with a Certified OpenADR 2.0b VEN, consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222619	Charles Knuffke (Legrand)	§110.12(a)1 and 2: The code should allow for OpenADR version updates that will likely arise during the current code cycle and as we head into the next.	Staff finds that the open ended referencing suggested by the commenter is expressly disallowed as it would effectively delegate lawmaking authority to a third party. References to language outside the regulations must be specific, including necessary date and version numbers, to ensure that all stakeholders have the opportunity to review the requirements before they go into effect. New versions of OpenADR would need to be considered in a future rulemaking proceeding, including the appropriate opportunity for all stakeholders to review the revision prior to inclusion in the Energy Code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222619	Charles Knuffke (Legrand)	§110.12(a)1 and 2: The current language mixes communication protocols and communication media, software and hardware, essentially putting CEC in the position of picking "winners and losers" in the marketplace.	Staff finds that the list of hardware layer communication requirements is necessary to ensure that all demand response devices have a functional and commonly available communication hardware. The specified protocols are the same ones identified in 2016 JA5, so the language represents a reorganization rather than a new requirement for most demand responsive controls. Staff has added language to more clearly state that the requirements represent a minimum set of requirements and that additional protocols can be implemented; staff does not find that the proposed language results in "picking winners and losers", and that defining a baseline ability to communicate as needed to perform as a demand responsive control is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222619	Charles Knuffke (Legrand)	§110.12(a)1 and 2: The phrase "shall be capable of" has been confusing in the past and should be edited to indicate that a response shall be required and quantifiable by means readily accessible to Acceptance Testing Technicians given the current training curricula.	Staff has removed this phrasing and is instead requiring specific certification, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222619	Charles Knuffke (Legrand)	§110.12(a)1 and 2: we suggest it would be best to rewrite these lines to the following: 1. A Virtual End Node (VEN) shall be used to communicate with Grid Operators via OpenADR 2.0a, OpenADR 2.0b or later version as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification. 2. All demand responsive control systems shall communicate with the building's OpenADR-compliant VEN, wherever it may be located (physical or virtual), and each system's devices shall respond to it automatically utilizing any desired communication protocol between the systems or individual control devices.	Staff amended the requirements of Section 110.12 to permit cloud-based systems, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222619	Charles Knuffke (Legrand)	Regarding the CEA's worry about future buildings being exempted from the Demand Response section (and the "Capable of" comment previously mentioned), we would hope that edits could be made that: 1. Eliminates the phrase "capable of." 2. Reduces the 10,000 sqft minimum to 5,000 sqft, where the bulk of the environment gets built. 3. Clarifies the .5W/sqft lighting power density as applicable to only those spaces that are not normally occupied. CEA would expect this value to be better aligned with where lighting power densities are currently, and where they will be when the 2019 Energy Code takes effect in 2020. To be clear, most occupancies can currently be engineered away from ADR measures. That condition would likely persist as the mean efficacy of individual luminaires increases and the code does not evolve to embrace it.	1. Staff has rephrased this provision to remove the phrase "capable of", consistent with the commenter's request. 2. This change would require a complete code change proposal demonstrating that these controls remain cost effective, given that the 10,000 square foot threshold was originally established owing to concerns that control of less than this minimum amount of lighting would not save sufficient energy to fully offset the costs of the controls. Staff invites the commenter to submit a complete code change proposal for the next (2022) rulemaking proceeding. 3. This change would require a complete code change proposal demonstrating that these controls remain cost effective, given that the power density threshold was originally established owing to concerns that control of less than this minimum amount of lighting would not save sufficient energy to fully offset the costs of the controls. Staff invites the commenter to submit a complete code change proposal for the next (2022) rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018

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222619	Charles Knuffke (Legrand)	We're very pleased to see that OpenADR is being adopted by the CEC as the "Lingua Franca" for demand response, which was a key suggestion in our letter.	Staff appreciate the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222619	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Align with work done in other California venues for inverter communications. Substantial work has been done in the California Rule 21 "smart inverter" interconnection proceedings to harmonize and standardize inverter communications, resulting in the California Common Smart Inverter Profile (CSIP). The CPUC, utilities and other stakeholders are building the framework for robust distributed energy resource participation in advanced energy markets, and developers, aggregators and manufacturers are responding.	Staff notes that the specifications in Section 110.12 are minimum specifications; staff has clarified the language of the section to make clear that additional protocols, such as those identified by the commenter, are fully allowed to be included and used. Staff does not find that foregoing inclusion of at least one basic protocol specified in Section 110.12 based on CSIP compliance would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Appendix JA12: The requirement appears to state that all battery storage systems must have the ability to program a summer and winter TOU schedule. However, Basic Control, which charges from solar to serve on-site loads, is not affected by time-of-use. If Basic Control is truly a minimum requirement and doesn't have a time-of-use component, why would the ability to program a TOU schedule be mandated a minimum capability here? If support for a TOU schedule is a minimum requirement, then would a system that has only Basic Control and serves all on-site load from on-site generated solar be considered non-compliant? Our proposed revision would clarify that, in order to qualify for TOU Control, the system must support at least a summer and winter schedule, which is a reasonable minimum.	Staff have rephrased the schedule requirements in JA12 for clarity consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Clarify intent and allowable operations for TOU Control. The language in JA12.2.3.2 could be read to imply that the only charging that's allowed is from grid, only during non-peak hours, and solar charging is not allowed. The Energy Commission should revise the language to show that the intent of operation is time-of-use shift to align solar generated energy with load, that the system is allowed to charge from grid off-peak, and is intended to discharge on-peak.	Staff have rephrased the time-of-use control requirements in JA12.2.3.2 for clarity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Clarify minimum requirements for Basic Control. Basic Control states that the battery can only charge when the PV production is greater than load, and that it must discharge at all times where the PV production is less than the load. Aside from the question of how the battery would get recharged if on-site load were always greater than production, typical system behavior is to first recharge the battery from any available solar production, both for battery health as well as that's how the physics works. In addition, the current language is potentially subject to gaming, as there is no defined performance objective for the battery discharge. The Energy Commission should clarify that the system charges only from solar, and discharges to serve load with the goal of maximizing self-consumption of that stored solar.	Staff notes that this comment appears to apply to the "Basic Control" rather than "TOU Control". Staff finds that clear control strategies that can be modeled in the performance software needed to reliably calculate the compliance credit for the measure. The Basic Controls section specifies a simple control strategy with a simple charge/discharge requirement to ensure an appropriate minimum functional baseline. The TOU controls that are available under JA12 provide additional charging flexibility that builds on the Basic controls, and the Advanced controls build on the TOU controls. Separately, if the batteries are allowed to charge when generation is less than load as suggested by commenters, then the energy to charge the battery is ultimately being purchased and drawn from the grid. In addition, this means that batteries are likely to be fully charged earlier in the day, forcing any excess generation by the solar panels to be exported back to the grid (instead of captured on-site for later use). Ultimately, this control schema results in loss of grid harmonization and afternoon ramp mitigation benefits, which is an outcome staff are trying to prevent with the current Basic battery control strategy. For these reasons, staff does not find that changing the Basic control specification in the manner suggested by the commenter would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018

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222620	Philip Undercuffler (OutBack Power)	Proposed Revision to JA12.2.3 Control Requirements: The requirements below are applicable to all control strategies. (a) The battery storage system shall have the capability of being remotely programmed to change the charge and discharge periods. ~~At the minimum~~ To qualify for TOU Control, the system shall be capable to program at a minimum a summer and a winter Time-of-Use (TOU) schedule.	Staff struck the sentence that the commenter is suggesting a revision to as part of a broader redrafting to improve clarity.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Simplify requirements to ensure energy management functions are not disabled without preventing reasonable and beneficial future program improvements. Energy storage systems can have a reasonable service life exceeding 20 years, but a requirement for a quarterly reset can be problematic as it will force the system to override any future improvements or upgrades. One of the greatest benefits of storage is its flexibility, and as new rate structures or utility programs become available it would be beneficial to allow these systems to participate. However, the current language would mandate that the system perform a quarterly reset to the best we could envision in 2017. If the intent of the reset is to ensure the benefits of the system remain active, it would seem more prudent and direct to have language preventing the energy management function from being disabled.	Staff has modified the quarterly reset requirements to semi-annual; the reset requirement is necessary to ensure that the battery will not remain in the "backup" power mode indefinitely, which loses all of its benefits and turns the battery into a liability to the grid. The commenters proposed solutions fall short of ensuring that the battery will remain in the active demand response mode in the long-term. A semi-annual reset still allows the occupant to override the program mode for whatever reason they think is necessary, but makes sure that the batteries are reset to the program mode and remain an asset to the grid. Separately, staff has added a new alternative battery control option to accommodate new ideas that may come up in the future that brings the same or better benefits to the home owner and the grid.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Suggested revision to JA12.2.3.2 Time-of-Use (TOU) Control (grammar correction and insertion of the phrase "for the purpose of solar and load shifting".	Staff finds that including this or a similar phrase in the directive criteria would have the effect of requiring that the manufacturer or installer of the equipment possess a specific purpose, which would not be enforceable. (Staff notes that the purpose and necessity of adopting a given provision is recorded in the Initial Statement of Reasons, and not stated directly in regulatory text.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Suggested revision to JA12.2.3.3 Advanced Demand Response Control: To qualify for the Advanced Demand Response Control, the battery storage system shall be programmed by default as Basic Control as described in JA12.2.3.1 or TOU control as described in JA12.2.3.2. The battery storage control shall meet either the demand responsive control requirements specified in Section 110.12(a) or the communications requirements of the California Common Smart Inverter Profile (CSIP). Additionally the battery storage system shall have the capability to change the charging and discharging periods in response to signals from the local utility or a third-party aggregator.	Staff notes that the specifications in Section 110.12 are minimum specifications; staff has clarified the language of the section to make clear that additional protocols, such as those identified by the commenter, are fully allowed to be included and used. Staff does not find that foregoing inclusion of at least one basic protocol specified in Section 110.12 based on CSIP compliance would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	Suggested revision: JA12.2.3.1 Basic Control To qualify for the Basic Control, the battery storage system shall be installed in the default operation mode to allow charging only from an on-site or community photovoltaic system ~~when the photovoltaic system production is greater than the on-site electrical load~~. The battery storage system shall discharge ~~when the photovoltaic system production is less than~~ to serve the on-site electrical load, maximizing solar self-utilization.	Staff finds that the proposed language would impose an operational requirement rather than a design requirement (that is, it would apply to how its tenants or occupants operate the building after the building is built, distinct from applying to the building's design and construction prior to, and as a condition of, the issuance of its occupancy permit); Part 6 applies to building design and construction and cannot impose operational requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222620	Philip Undercuffler (OutBack Power)	Suggested revision: (c) The battery storage system control strategy shall prevent unauthorized persons from disabling the energy management functions of the system. ~~shall perform a system check to ensure the battery is not left in backup mode in anticipation of a power interruption, and reset the operation mode to one of the control strategies listed in JA12.2.3.1, JA12.2.3.2, and JA12.2.3.3, at a minimum, on the following calendar dates :~~ ~~1) January 1st~~ ~~2) May 1st~~ ~~3) July 1st~~ ~~4) September 1st~~	Staff finds that the proposed language is vague and unenforceable (i.e., how do we prevent "unauthorized" persons from modifying the battery controls after the building is occupied? If should the controls are overridden, how does the battery goes back to the program mode?). For this reason, staff does not find that adopting the proposed change would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222620	Philip Undercuffler (OutBack Power)	The list of allowable communications transport layers for OpenADR in 110.12(a) is overly restrictive and limited; as an example it does not include cellular modems, which are common in the solar and storage industry as the systems are often installed outdoors and the customer's Ethernet is either not available or not reliable, as an allowable communications transport. Ideally, the communications requirements should be aligned across the state for the same resources, or at a minimum an optionality to support either standard should be provided.	Staff notes that the specifications in Section 110.12 are minimum specifications; staff has clarified the language of the section to make clear that additional protocols, such as those identified by the commenter, are fully allowed to be included and used. Staff does not find that foregoing inclusion of at least one basic protocol specified in Section 110.12 based on CSIP compliance would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222620	2/20/2018
222621	Francesca Wahl (Tesla)	Advanced module or inverter technologies available today can help mitigate the impact derived from minimal shading. Section JA11.3.2, PV Array Geometries Performance Input, notes that if the minimal shading criterion above is not met, the geometries of the PV array should be described in the performance method. In order to evaluate the performance method as a viable, alternate compliance option, more detail will need to be provided in the Compliance Manual.	Staff will provide additional detail in the Compliance Manual, as suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	As currently written, basic control appears to simply be saying that the battery must charge from PV and discharge to the home without exporting. There may be some cases where it makes sense to charge the battery before serving onsite load that are separate from Time-of -Use (TOU) control. We suggest the following modification to the current language under the basic control requirements: " battery storage system shall be installed in the default operation mode to allow charging only from an on -site or community photovoltaic system ~~when the photovoltaic system production is greater than the on-site electrical load.~~ The battery storage system operates such that it shall discharges when the photovoltaic system production is less than the on-site electrical load."	Staff finds that clear control strategies that can be modeled in the performance software needed to reliably calculate the compliance credit for the measure. The Basic Controls section specifies a simple control strategy with a simple charge/discharge requirement to ensure an appropriate minimum functional baseline. The TOU controls that are available under JA12 provide additional charging flexibility that builds on the Basic controls, and the Advanced controls build on the TOU controls. Separately, if the batteries are allowed to charge when generation is less than load as suggested by commenters, then the energy to charge the battery is ultimately being purchased and drawn from the grid. In addition, this means that batteries are likely to be fully charged earlier in the day, forcing any excess generation by the solar panels to be exported back to the grid (instead of captured on-site for later use). Ultimately, this control schema results in loss of grid harmonization and afternoon ramp mitigation benefits, which is an outcome staff are trying to prevent with the current Basic battery control strategy. For these reasons, staff does not find that changing the Basic control specification in the manner suggested by the commenter would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018

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222621	Francesca Wahl (Tesla)	As described in section 150.1 in subchapter 8, the current EDR language attributes value to demand flexibility measures such as battery storage, yet it is still unclear from the language provided to what extent battery storage will receive credit toward the efficiency equation of the EDR. It is important that batteries be allowed to receive credit toward meeting a portion of the efficiency EDR through the performance compliance approach. It will be critical that the Residential Compliance Manual process outlines the opportunity to utilize a grid harmonization credit for battery storage for both the efficiency and demand flexibility components of the EDR. We look forward to working with staff and stakeholders on this process.	Modeling calculations such as that for the credit for the battery plus PV system are described in the ACM Reference Manual. The current public release version of the 2019 CBECC-Res software correctly models the "Self-Utlilization Credit".	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	At minimum, if the OpenADR 2.0 requirement is adopted, a cloud solution must be adequate to allow flexibility in communications standard implementation. We, therefore, recommend the following addition to Section 110.12 a): Be capable of communicating with an OpenADR 2.0b Virtual End Node (VENs), as specified by Clause 11 of the OpenADR 2.0b specification.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	Generally, Tesla continues to believe that requirement JA12.2.3 c) is unnecessary as it could impact the customer experience. Concerns about battery operation that could negatively impact grid interaction are already addressed by utility interconnection agreements and through economic price signals sent to the costumer.	Staff finds that JA12.2.3 is needed to ensure that batteries do not remain the backup mode indefinitely, which is critical for achieving grid and occupant benefits. Manufacturers have been unable to propose an alternative that is as effective as this requirement.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	It is unclear from the current language if Home Energy Rating System (HERS) verification is required, which may further negate the need for JA 11.4.	Staff notes that HERS verification of solar photovoltaic systems is not required by the Express Terms, in part because it is redundant with the benefit of JA11.4.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	Section 110.12 appears to establish a requirement to utilize OpenADR 2.0 for all demand responsive controls under any demand management technology including battery storage systems. We recognize that the OpenADR program is intended to facilitate DR and lower costs and complexity overall but mandating communication protocols may have the opposite effect. Innovation in the device and DR space may identify a superior solution, at which point this requirement would only increase the cost of DR-participating devices. At this time, the industry is not adequately mature to know which is the appropriate protocol to establish as the standard so it would be premature to tie these requirements to OpenADR. For example, the California Public Utilities Commission has adopted a competing standard for distributed energy resources (DER) – Smart Energy Profile (SEP) 2.0 – for their monitoring and control requirements.	Staff has added language expressly clarifying that "Demand responsive controls may incorporate and use additional protocols beyond those specified in Sections 110.12(a)1 and 2." Staff does not find that Section 110.12 places any limitation on the device's ability to use alternate, innovative protocols.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	The current JA12.2.3.2 TOU Control language does not define “peak” when referring to TOU hours. Without a standard definition for peak hours, some peak period may not be captured. Staff should either develop a definition for “peak” to include the peak hours defined in any given day or alter the proposed language to state that “begin discharging to the dwelling and/or the grid only during the non off peak TOU hours.”	Staff has rephrased this section to improve clarity and remove the term "peak" (instead referring to "highest priced hours"), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018

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222621	Francesca Wahl (Tesla)	The current wording of the minimal shading criterion JA11.3.1 appears to recommend that no shading is allowed versus establishing a minimal shading requirement. Under a minimal shading requirement, there should be a maximum allowance of some shading as this is often standard in PV system designs.	Staff finds that the current language is unambiguous and enforceable - systems that are more than minimally shaded are subject to a performance-based evaluation. Staff finds that the suggested changes to this requirement will add unnecessary complexity, will be hard to enforce and may be subject to gaming; staff therefore does not find that making this change would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	The solar access verification requirement may be unnecessary given that the design process for a new community already accounts for shading.	Staff finds that the Solar Accress Verification requirements are not redundant with the design process; they are the documentation that demonstrate if shading is an issue or not.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	There may be some redundancy in requiring compliance with both JA 11.3.1 and JA 11.4 as the usefulness of the data provided in JA 11.4 is unclear, especially if the minimal shading levels outlined in JA 11.3.1 are met.	Staff has redrafted JA11.4 to clarify its application and remove redundancy, consistent with the commenter's suggestion: JA11.3.1 establishes the criteria, while JA11.4 provides the test procedure to be used to determine if the JA1.3.1 criteria are met.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222621	Francesca Wahl (Tesla)	While the JA12.2.3.3 Advanced Demand Response Control section focuses specifically on DR, enabling the flexibility to incorporate additional control strategies under an advanced control strategy is important. Currently, the control strategies do not capture potential future strategies such as dynamic real time price signals and variations of demand charges. Therefore, it could be beneficial to broaden the title of this section to address “Advanced Control” rather than solely focusing on DR. Alternatively, a fourth control strategy could be added similar to our recommendation in previous comments to include a “Flexible Control” strategy.	Staff has added an "Alternative Control Approved by the Executive Director" option, consistent with the commenter's suggestion of a "flexible control" option. (Staff notes that the DR control strategy does not preclude more dynamic behaviors than the minimum functional behaviors specified in Section 110.12, nor does Section 110.12 limit the inclusion of advanced behaviors into DR controls.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222621	2/20/2018
222623	Charles Knuffke (Wattstopper Legrand)	We have issue when exceptions for a section appear at the end of the section instead of under the first paragraph, as seen in Exceptions 1 and 2 in Section 130.1(c). (Title 24 Part 6 General Comment)	The exceptions to the subsection are organized to be following right after the subsection; while the exceptions to the section are organized to be after all the subsections and towards the end of the sectiion. This editorial rule of thumb provides consistency of the language and editornial changes not following the rule of thumb could confuse majority of readers and users of the Standard.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	2/20/2018
222623	Charles Knuffke (Wattstopper Legrand)	We are pleased that the code now includes exemptions for I-3 (Prison) and I-4 type facilities, in addition of the "I" occupancy types in Section 100.1(a). Section 100.1(a)	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We do not understand why the control requirement of Title 20 is moved from Title 20 to Title 24. We would like to hear an explanation of the beneift of having language in both Title 20 and Title 24, since the two codes are not aligned on their revision schedules. (Section 110.9)	Staff notes that the reason for this change is stated in the Initial Statement of Reasons, and stems from the difference in revision schedules: without this movement, a change in Title 20 happening between revisions of the California Building Standards Code would have the effect of changing Title 24 requirements outside of its cadence. Returning the language to Title 24 removes this risk.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	As the chief author of the letter provided to the California Energy Commission from the California Energy Alliance (CEA) regarding demand responsive controls, we applaud the decision to specifically name OpenADR2.0a or 2.0b as the protocol used to instigate a DR action, although to future proof the code, adding the phrase “or later versions” would be warranted.	Staff notes that "speculative" regulations such as the "or later versions" recommeneded by the commenter cannot legally be adopted: doing so would cause any later publised update or amendment to the document to immediately become law without public notice or opportunity for comment, in violation of the Administrative Procedure Act.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We believe that the language in 110.12(a) 1 & 2 is still confusing. The OpenADR does need to be received by the building, but with current technology we question whether that signal needs to actually go to the building or to whether it can be received at some other location. We also believe that the second paragraph should be changed so any communication protocol can be used to communicate from the device receiving the signal to all the Demand Response Lighting Controls in the building.	Staff has revised the language of the section for clarity, added the option to use a cloud-based VEN, and removed the phrase "for communication within the building", consistent with the commenter's suggestions.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	

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222623	Charles Knuffke (Wattstopper Legrand)	Legrand recommend to remove the specific list of spaces in this language and allow the use of remote annunciated area control devices wherever specifiers determine they are appropriate based on their understanding of the safety and security requirements of the space. The Exception to Section 130.1(a)1 and 2	Staff does not find that making these requirements fully discretionary would be appropriate, given that it would make the provision unenforceable. Staff has instead expanded the list of spaces where this approach may be used, and specified "and other areas where placement of a manual area control poses a health and safety hazard" to provide flexibility for cases where relocation of controls is necessary to avoid a specific, documentable hazard.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Legrand wish (propose) to list Occupancy Sensor as an area control device as they offer ideal controlin public restroom and warehouse aisle applications.	Staff finds that this proposal is a new, separate proposal unrelated to the proposed amendments to the Express Terms (and is not a comment on a proposed change). Staff also notes that the current use of the term "area control" refers specifically to manual controls, and that a proposal to "list occupancy sensors as an area control" would be at odds with how the term is now used. Staff have instead added clear direction to Section 130.1(f)7 regarding use of automatic-on functions and rephrased other requirements to avoid inadvertently restricting the availability of automatic-on functions for these and other applications. Staff does not find that a total Exception to manual control requirements based on the presence of automatic controls would be appropriate; staff would instead consider adding to the Exception to Section 130.1(a)1 for spaces where restricting the use of these controls would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	1. There maybe an issue as restroom is in the exemption to the multi-level control requirement of Section 130.1(b) and restroom is not listed in the Table for multi-level control requirements. 2. There is an issue with classrooms as they (the control requirements) have been removed from the language but classroom is listed in Table 130.1-A. 3. Why areas that were required to have Partial or Full Off by occupancy sensors are required to have a beteen 20-60% full power in Table 130.1-A instead of the 30-70% range.	1. Staff does not find there to be any issue or conflict in the language. Table 130.1-A specifies uniformity requirements applicable to multilevel lighting, not areas where multilevel controls are required. The exceptions noted for the Table have been revised to be clear that they are exceptions to the table's "Minimum Required Control Steps" column. 2. Staff does not find there to be an issue: for multilevel requirements, classrooms were only expressly mentioned in an exception to the minimum required control steps. Staff finds it appropriate to move the exception to Table 130.1-A given that the exception is specifically to a requirement in this Table. 3. Staff notes that these ranges are existing ranges adopted in prior rulemakings; the rulemaking record under which the range was adopted includes the reasoning for each range.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We appreciate that several paragraphs in the section have reverted back to the previous code language compared to the Express Terms.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We do wish the CEC would consider adding spaces like mechanical room working under a chiller, or in an elevator pit to the Exemption for automatic shut off controls.	Staff did not receive a code change proposal relating to adding new spaces to this Exception; as this potentially increase energy use in these spaces, a complete code change proposal analyzing the benefits and costs of adding these spaces to the Exception would be necessary for staff to consider making the change. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Legrand recommend that countdown timers be allowed as an acceptable automatic shut-off control method for closets and small to medium storage spaces.	Staff notes that countdown timers are already allowable for closets up to 70 square feet in size. Staff does not find that permitting countdown timers in larger spaces (where vacancy sensors are cost effective) to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We reserve our comments on the language about "Manual on for Scheduling" till we can review the planned code language changes.	Staff added Section 130.1(c)1E in the 15-day language, that expressly permits inclusion of manual-on functions in automatic controls.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Thank you for adding restrooms to the list of spaces required to use occupancy sensors.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Our only request is to please use "Manual On" and not "Vacancy" as the proper description in the nonresidential code.	Staff notes that the use of the term "vacancy sensor" is fully intentional and correct where it is used. The language in Title 20 relating to these devices originated in Title 24; it has been and remains applicable to both residential and nonresidential controls where the term is used.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Do not understand why all spaces inside a healthcare facility would be exempt from the entire automatic shutoff section. We believe this section should be rewritten to identify which specific spaces in healthcare facilities do or do not require shut off controls.	Energy Commission staff received input from OSHPD staff that these requirements are not appropriate for healthcare facilities. Staff finds that the exclusion is appropriate given overriding concerns expressed by OSHPD regarding operation of lighting systems during emergencies, where spaces within the healthcare facility may be repurposed to provide emergency services; staff therefore does not find that rewriting the section in the manner suggested by the commenter would be appropriate. Staff will work with OSHPD in future code cycle to devleop energy efficient measures appropriate for healthcare facilities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	1. Previously there was a note in this section that modular walls were not be considered permanent structures. 2. Legrand suggest to develop language for an exemption for primary sidelit and secondary sidelit daylit spaces since they can be in places without adequate daylighting.	1. Staff finds that the explanatory note about modular walls is better located in the Compliance Manual as it clarifies about permanent obstruction and does not have any regulatory effect. 2. For sidelit daylit zones, there are diffuse daylight as well as direct sunlight available. Staff finds that the suggested change could potentially increase energy use, therefore a complete code change proposal would be needed analyzing the benefits and costs of the current and proposed control requirements would be necessary to consider the suggested change. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	

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222623	Charles Knuffke (Wattstopper Legrand)	The Section 130.1(d)3A references 130.1(c) as the mutlilevel requirement, should have been 130.1(b)?	Staff has corrected the noted section reference, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	There are no definitons for "overhang rise" in Section 100.1, and it looks like "overhang projection" will be deleted.	Staff has added definitions for "overhang projection" and "overhang rise", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	1. The section (130.1(d)) in the 45 Day Language and the previous code has been confusing. Anything that could be done to make it clear what the 120 watts applies would be appreciated. The word "combined" seems to indicate you add both zones together. 2. Additionally it is extremely difficult to control different cardinal directions of lighting in a space with a single photocell.	1. Staff finds that the phrasing of Exception 3 to Section 130.1(d) is clear and unambiguous: "combined" refers to combining (summing) the lighting power of the Skylit Daylit Zones and Primary Sidelit Daylit Zones in the room. Staff finds that this is consistent with prior versions of the Standards as well as with the CASE report (which specified that the controls are not cost effective if controlling less than 120 watts of lighting). 2. The requirement of automatic daylighting control allows designer to choose the number of photocell required for the installations and it does not limit to one photocell per space. If the suggestion is to require installation of additional photocells, staff notes that this would need a complete code change proposal that describes the costs and benefits of installing additional photocells. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	1. We would recommend the entire section of 130.1(f) be eliminated and the Section 130.1(d) be amended to include an override of max. 2 hours. 2. The control interaction section treats each sections interface device and the control devices separately. With these paragraphs, the CEC will create confustion in the specification community rather than resolution. 3. in Section 130.1(f)3, the multi-level lighting control should set a maximum electric lighting level and the daylighting control device should be able to reduce the electric light level based on the daylight available but not exceed the electric lighting level already set by the multi-level control. The wording makes it seem like the multilevel control doesn't cap the daylight level, which it should.	1. Staff finds that Section 130.1(f) provides necessary specifications for ensuring that all of the required controls provide their associated energy reduction benefits,and therefore achieve their anticipated cost savings. With regards to the override, staff notes that the specifications are drafted to not be overly prescriptive, and for this reason do not specify an override as the sole and specific way of ensuring beneficial interaction between daylighting and dimming controls. 2. Staff finds, in reviewing the received public comments, that stakeholders generally appreciate the clarity and specificity provided by Section 130.1(f). Staff therefore finds that it would be unlikely for it to cause rather than reduce confusion compared to remaining silent on the interactions of these controls, and that eliminating it would not be appropriate. (Staff notes that each subsection generally pairs two types of controls in order to clearly describe their basic interactions in an atomic fashion; this does not prevent a single control or user interface from performing multiple functions.) 3. Staff notes that the purpose of this section is solely to prevent control functions from thwarting one another, and to otherwise allow any control schemes that comply with these requirements. Having the multilevel control act as a cap is one control method that would satisfy the requirements, however there are others: the daylighting control could also act as a modifier to the amount of light requested by the multilevel control, so that the light output is the product of both inputs. Staff's language intentionally avoids unnecessarily prescribing specific control schemes, so as to allow maximum flexibility while ensuring that none of the controls are inadvertently prevented from providing their benefit.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	20. BUG & Outdoor Controls 1. Legrand recommends adding back the language of "outdoor lighting shall be independently controlled from other electrical load by an automatic scheduling control." 2. Legrand questions why the proposed "2 hour override for exterior lighting. Not every exterior switchleg has an override switch. 3. Legrand questions why the previous code language of the maximum wattage zone size limits for luminaires controlled by motion sensing is not in the proposed language. Legrand recommends to include a maximum wattage zone limit and use a maximum allowed 600 watts. 4. Legrand don't think the proposed "Exemption 3 where trees block motion" should be included.	1. Staff has restored this provision, consistent with the commenter's suggestion. 2. Staff has revised the language to specify that an override may be included (and is not required), consistent with the commenter's comment. 3. Staff has restored the prior language limiting the total watts of a single controlled zone; staff notes that the prior limit was based in part on controlled area, and in part on determining the minimum amount of controlled lighting power needed to ensure that the action of the control would result in energy bill savings that fully offsets its cost. Staff finds that the CASE analysis is ambiguous on the specific question of cost as a function of area, and thus finds that erring on the side of caution and retaining the existing limit to be appropriate. 4. Staff has removed the Exception for areas where trees may block sensors, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We do not understand why all spaces in healthcare facilities would be exempted from the controlled receptacle requirement of Section 130.5(d)	Energy Commission staff received input from OSHPD staff that these requirements are not appropriate for healthcare facilities. Staff finds that the exception is appropriate given overriding concerns expressed by OSHPD that requiring controlled receptacles creates a fully avoidable risk of vital equipment being unintentionally plugged into a controlled receptacle, especially during emergencies where spaces within the healthcare facility may be repurposed to provide emergency services and equipment relocated under extremely high-pressure circumstances. Staff therefore does not find that removing the exception would be appropriate. Staff will work with OSHPD in future code cycle to devleop energy efficient measures appropriate for healthcare facilities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	

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222623	Charles Knuffke (Wattstopper Legrand)	Commenter does not understand why there is a Power Adjustmen Factor (PAF) allowed for Clerestories since those have been treated similar to any other vertical glazing which produces sidelt daylit zones.	The explanation of the benefits of clerestories, including the justification for the proposed Power Adjustment Factor, are found in the CASE report for Advanced Daylighting Design.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Legrand applaud the CEC for coming up with a simple method of adjusting the wattage of a tunable luminaires.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Do not understand why 130.5(d) is not included in the list of sections that must be followed in Section 141.0(b)2F, The CEC should add 130.5(d) to the list.	Controlled receptacles are not required in alterations under the current (2016) Standards; staff finds that a complete code change proposal that analyzes the costs and benefits of retrofitting controlled receptacles into existing spaces would be necessary to extend the requirement as suggested, as costs in the context of an alteration can be significantly different than in the context of a newly constructed building. Staff invites the commenter to submit a code change proposal for the 2022 rulemaking cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	Legrand applaud the CEC attempting to make the lighting alteration Section of 141.0(b)2I more understandable.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222623	Charles Knuffke (Wattstopper Legrand)	We believe that allowing a complete exemption for plug load controls in alteration is a huge mistake. The CEC should rectify the situation by replacing the word "circuit" with "receptacle" in Section 141.0(b)2Piv and also by providing an exemption for some small number of newly installed receptacles, perhaps 20.	Staff notes that no changes are proposed to the language in Section 141.0(b)2Piv; staff finds that a complete code change proposal that analyzes the costs and benefits of retrofitting controlled receptacles into existing spaces would be necessary to consider applying the Section's requirements to replacement branch circuits, as costs in the context of a smaller alteration to the electrical system can be significantly different than in the context of a complete replacement of the entire system. Staff invites the commenter to submit a code change proposal for the 2022 rulemaking cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222623	
222624	Natural Resources Defense Council (NRDC)	Credit for energy storage should be technology neutral and performance-based.	Staff notes that this comment relates to compliance modeling software and not to the proposed changes to regulatory text that are a part of the rulemaking proceeding. Staff will include modeling of additional storage options (and associated energy benefits/credits) as a part of updating its compliance modeling software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC also supports the improved prescriptive insulation requirements for high performance attics in single family and multifamily homes.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC appreciates and strongly supports the residential standards compliance software, CBECC-Res, reporting home carbon emissions in addition to energy performance.	Staff will include reporting of carbon emissions associated with modeled energy consumption as a part of updating its compliance modeling software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC is generally very supportive of CEC's proposal for the standards.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC requests that CEC add to the CALGreen code a discussion of how CBECC-Res may be used to set emissions-based reach codes, as discussed at the hearings	Staff notes that updates to Part 11 are part of a separate, parallel rulemaking proceeding; staff will consider this comment as a part of that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC strongly supports the inclusion of a performance path credit for compact hot water distribution systems, laid out in Reference Appendix RA4.4.6.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	NRDC supports the mandatory PV requirement in residential new construction, separate from the efficiency requirements, which has been a key aspect of this proposed code change.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	Performance Path Credit for Compact Hot Water Distribution Systems: Footnote 7 has been edited incorrectly, and the word "either" should be "neither".	Staff has corrected the word "neither", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	Performance Path Credit for Compact Hot Water Distribution Systems: Revise Footnote 8 regarding the point of measurement as follows: "For example, a shower/tub combination would take the measurement from the ~~center~~ fixture supply outlet of the shower/tub, while a two sink lavatory in the master bath would take the measurement from the ~~center~~ fixture supply outlet of the furthest lavatory." Reference to the "center" of a fixture is unnecessarily imprecise. The water supply outlet is a preferable point of measurement, as it is a more specific point, just as visible in plan view, and the actual point of use by the end-user.	Staff has replaced the word "center" with the phrase "fixture supply outlet", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018

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222624	Natural Resources Defense Council (NRDC)	Performance Path Credit for Compact Hot Water Distribution Systems: Revise the language on Weighted Distance for clarity as follows: "MasterBath = The plan view, straight line distance from the water heater to the furthest fixture served by that water heater in the master bathroom (feet)." Make similar revisions for Kitchen and FurthestThird. In projects with multiple water heaters, the distance between a hot water outlet and the water heater that is specifically serving that outlet is most relevant.	Staff have made revisions to this language consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	Performance Path Credit for Compact Hot Water Distribution Systems: Table 4.4.6-2: Confirm the values shown in this table for 3-story homes. The value of coefficient "a" for Non-Recirculating distribution systems ("10") appears inconsistent with values in the table for 1- and 2-story homes, and may be a typographical error.	Staff has reviewed and corrected the noted values, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	Quality insulation installation, a procedure for installing and verifying the efficacy of insulation, will be a prescriptive requirement in the code for the first time, something NRDC strongly supports	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	The total storage credit that can be counted toward efficiency requirements should not exceed the battery storage credit, in order not to provide excessive trade-off on the efficiency of the building envelope, which remains critical to energy savings and GHG emissions reductions.	Staff will include modeling of additional storage options (and associated energy benefits/credits) as a part of updating its compliance modeling software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We believe that the proposed storage credits are appropriately balanced with energy efficiency requirements which remain critical to energy savings and GHG emissions reductions.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We expect the credit from thermal storage measures to be smaller than the battery credit, reflecting smaller, but nonetheless important and very affordable, storage capacity.	(Staff finds that this comment does not relate to the Express Terms, but relates to the CBECC modeling software; none the less, staff will include modeling of additional storage options (and associated energy benefits/credits) as a part of updating its compliance modeling software, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We expect this addition to take the form of a standard design described in the Alternative Calculation Method (ACM) Reference Manual, to be discussed at a CEC workshop in May 2018.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We further request that CEC initiate stakeholder discussions on the GHG emissions profile used to produce the carbon emissions reporting in CBECC-Res. We ask CEC to publish the existing hourly schedule and methodology prior to soliciting stakeholder input so we may improve the carbon valuation methodology to reflect accurately the emissions impacts of energy design choices made in the 2020-2022 period.	Staff notes that this comment relates to compliance modeling software and not to the proposed changes to regulatory text that are a part of the rulemaking proceeding. Staff therefore will consider this request outside of the context of the rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We strongly support CEC's commitment, announced at the February 5th hearing, to provide an independent compliance option for electric water heating.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We support CEC's proposal to provide a limited compliance credit to battery energy storage systems, that will provide several energy design rating (EDR) points of credit towards the energy efficiency target score.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We support CEC's proposed approach that would set the baseline to an electric water heater that meets federal minimum energy efficiency standards, combined with two complementary efficiency measures, as discussed by CEC staff at the hearing: compact distribution and drain water heat recovery.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018

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222624	Natural Resources Defense Council (NRDC)	We support the improvements being made to prescriptive and mandatory envelope energy efficiency. While this change represents less of an improvement than was deliberated in the pre-rulemaking, we see it as sensible given the technical challenges raised.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222624	Natural Resources Defense Council (NRDC)	We urge CEC to make a credit similar to the batter storage credit available to thermal storage systems – including grid connected flexible electric water heating and pre-cooling or pre-heating – when they are controlled similarly to the control schemes prescribed for battery storage. (suggested language pages 7-15)	Staff notes that this comment relates to compliance modeling software and not to the proposed changes to regulatory text that are a part of the rulemaking proceeding. Staff will include modeling of additional storage and demand flexibility options (and associated energy benefits/credits) as a part of updating its compliance modeling software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222624	2/21/2018
222625	Luke Price (Public Health England)	Letter in opposition to NEMA 77. Includes proposal on pages 6-8.	Staff notes that this comment is responding to another commenter, and is not related to a change proposed to regulation (as staff did not include use of NEMA 77 in the Express Terms). Staff appreciates the detailed comparisons at both frequencies of 60 and 120 Hz, and does take note of the commenter's concerns with regards to use of NEMA 77 in place of JA10.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222625	2/21/2018
222626	CASE Team	(Section 2.2 of the letter is summarized below) The commenter provides a copy of the minimum recommended revision to the 45-Day Language (to bring controls coverage back to parity with the standards).	Staff has revised the outdoor lighting control requirements to more closely align with the 2016 requirements, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	The 45-Day language no longer require scheduling controls in addition to motion controls for those applications where motion controls are required.	Staff has aligned the Express Terms to existing language; staff notes that the existing provision requiring scheduling controls appears to mention these controls inadvertently, and it is not fully clear that scheduling controls remain cost effective when sensor-driven controls are also installed.		
222626	CASE Team	(continue the list from above, from Table 1) 2. Allow for 75% after hours power reduction. 130.2(c)3 (Section 2.4 of commenter's letter are summarized below and they are of the same subject as Item #2 here.) The IOU CASE Team recommends the lighting system power be reduced by at least 75% when unoccupied after hours. If this is not considered feasible, the CASE Team recommends to allow but not require that advanced controls be used.	Staff finds that the proposed item is not technically feasible as none of the occupancy sensors currently available on the market are capable of complying with these requirements.		
222626	CASE Team	(continue the list from above, from Table 1) 3. Require a maximum of 800 watts of lighting power be controlled together. 130.2(c)3	Staff has restored the 1500w limit, consistent with the commenter's suggestion. (Staff's original rationale was that the existing language could be read to require completely independent and redundant controls, which is unlikely to be cost effective.) Staff does not find specific justification that would be sufficient for establishing an 800w limit in place of the 1500w limit.		
222626	CASE Team	(continue the list from above, from Table 1) 4. Reduce the motion control exception wattage to 30 watts for outdoor luminaires. Exception 1 to 130.2(c)3:	Staff finds that the 40 watt threshold best aligns with reducing the existing 75 watt limit to the wattage of an equivalent LED product in that it avoids unnecessarily narrowing the classes of available equivalent LED products.		
222626	CASE Team	(continue the list from above, from Table 1) 5. Revise scope of motion controls as an inclusive description of covered applications. 130.2(c)3	Staff has rephrased this Section to improve clarity; staff does not find that inclusive, rather than exclusive, language results in the clearest presentation of subsections Di and ii.		
222626	CASE Team	The 45 Day language as written includes these application which were not included in the 2013 and 2016 CASE reports: building entrance, drive up windows, vehicle service station uncovered dispensers, ATM machines, sales canopies, non-sales canopies, guard stations, student pick-up and drop off areas. We recommend revising the code language to clearly identify the space types that require motion sensing controls, rather than having a long list of exempted applications.	Staff finds that specifying the listed applications (building entrance, drive up windows, vehicle service station uncovered dispensers, ATM machines, sales canopies, non-sales canopies, guard stations, student pick-up and drop off areas) plus special security lighting for retail parking and pedestrians, are required to meet the existing code requirement of daylight control and indepent control from other electrical loads of existing code section 130.2(c)1 and 2. They are not required to meet other section requirements of Section 130.2(c) with the exception of motion sensing controls for luminaires mounted at 24 feet or less above ground.		

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222626	CASE Team	150.0(k)1.Cvi and 150.0(k)1.H: Require that sources in recessed and enclosed luminaires be Joint Appendix 8 (JA8) certified and specifically identify the "JA8-2019-E" marking requirement.	Staff finds that the language in Section 150.0(k)1Cvi is redundant with the language in Table 150.0-A, and thus that removing the language is appropriate. Staff also finds that the rephrasing of Section 150.0(k)1H prevents alternate, unintended readings that had the effect of divorcing the marking requirement of JA8 from the underlying need for the lighting to be able to function in an elevated temperature environment (thus resolving an issue where some fully integrated luminaires were prevented from being installed despite being fully capable of performing in that environment). Staff therefore finds referencing the elevated temperature requirement rather than the associated marking requirement to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	(Section 2.1 of the letter is summarized below) The 45-Day language does not have the important features of the 2016 Standards: 1. Luminaires required to have motion controls are also required to have scheduling controls, which are clearly divided from the requirements for motion controls. 2. Because larger control zones have a higher probability of being occupied somewhere in the zone than smaller zones, motion control zones are limited to no more than 1500 watts being controlled together. 3. Luminaires are required to be capable of parital off control, which is important because the control is not disabled but recommissioned to partial off if occupant's perception of safety requires some illumination, even when no activity is detected.	1. Staff finds that there is a misunderstanding of the code requirement in the comment (that scheduling control is required in addition to motion controls for those applications where motion controls are required). The existing requirement of Section 130.2(c)2 is about outdoor lighting being controlled separately from other electrical loads; staff finds that the mention in this Section of automatic scheduling controls in this Section is inadvertent and was not intended to impose a requirement for these controls. (From a review of prior rulemaking materials, staff found that it was intending to reference the same controls as Section 130.2(c)1 and an editing error led to a mismatch in terms). 2. Staff restored the 1,500 watt limit present in 2016; staff did not find that altering this to an 800 watt limit was sufficiently justified to be appropriate. 3. Staff has rephrased the requirement to make it clear that the requirement to automatically dim the lighting by 50% or more and the requirement to automatically turn OFF the lighting are separate, thus ensuring that the lighting possesses a step between full-ON and OFF that can be automatically entered. This ability is equivalent to the partial-OFF function suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	(Section 2.3 of the letter is summarized below) 1. The exception to Section 130.2(c) of the 45-Day language addresses those few areas where motion sensors are not feasible. This is rare as the location blocked by trees or other obstructions is not a good site for the luminaire either. 2. The timed manual override of Section 130.2(c)4 is a good feature, though we recommend that this be an option and not a mandatory feature.	1. Staff has removed this Exception, consistent with the commenter's suggestion. 2. Staff has made this provision permissive rather than prescriptive, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	(Section 2.4 of the letter is summarized below) The commenter recommends additional changes to achieve greater savings beyond the 2016 requirements and this is to require that the lighting system power be reduced by at least 75 percent when unoccupied after-hours.	Staff finds that the recommendaion is not technically feasible: staff finds a lack of products that support the proposed measure of 75% after hours power reduction (second time-out) after the 50% power reduction during vacancy (first time out). The two products identified and studied by the commenter are designed to shut off the light after the second time-out instead of lowering lighting to the proposed 75% lighting power reduction (as indicated on the product literature). Staff therefore does not find that including this requirement would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	CASE Team recommends revision to the 45-Day language include the following. (from Table 1 of commenter's letter) 1. Maintain stringency of the 2016 Standards by including deleted requirements in the 45-Day Language. 2. Allow for 75% after hours power reduction. 3. Require a maximum of 800 watts of lighting power be controlled together. 4. Reduce the motion control exception wattage to 30 watts for outdoor luminaires. 5. Revise scope of motion controls as an inclusive description of covered applications. 130.2(c)	1. Staff has revised the language of Section 130.2(c) to ensure equivalent stringency, consistent with the commenter's suggestion. 2. Staff finds that the recommendaion is not technically feasible: staff finds a lack of products that support the proposed measure of 75% after hours power reduction (second time-out) after the 50% power reduction during vacancy (first time out). The two studied products are designed to shut off the light after the second time-out instead of lowering lighting to the proposed 75% lighting power reduction (as indicated on the product literature). Staff therefore does not find that including this requirement would be appropriate. 3. Staff is proposing to restore (but not otherwise change) the 1500 watt motioin sensing control requirement, consistent with the commenter's suggestion to align more closely with the 2016 language. Staff does not find that reducing this value would be appropriate as staff does not find a sufficiently rigorous justification of the specific lower thresholds proposed by commenters. 4. Staff finds that a 40 watt threshold for the Exception is more appropriate based on the identified Documents Relied Upon and the broad types of lighting to which the exception would apply. 5. Staff finds that the proposed 15-day language provides a clearer phrasing of motion control requirements, noting that staff did not find that an inclusive rather than exclusive phrasing necessarily improved clarity.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018

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222626	CASE Team	Section 130.1(c)3: Require that automatic time-switch controls be configured to operate in manual-ON mode.	Staff has added language to specify that automatic time-switch controls may include manual-ON behavior; staff notes that Part 6 cannot impose operational requirements, and may only specify which features are required to be available to occupants / tenants. (To the extent that the commenter is proposing a new requirement to provide a manual-ON feature, staff notes that requiring an additional feature is likely to impose additional costs and that a cost analysis would be needed for the Energy Commission to consider the proposal. Staff would therefore invite the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	Section 130.1(d)3: Require dimming to no greater than the minimum dimmed state of the luminaire or the lowest setpoint in accordance with Table 130.1-A.	Staff finds that imposing a more stringent requirement than the current 65% dimming specified for daylighting controls would potentially increase costs, and that a cost analysis would therefore be required in order for the Energy Commission to consider the proposal. Staff therefore invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	Table 150.0-A: Add language in Table 150.0 that specifically describes marking that specifiers, contractors and inspectors should be looking for without sending them to the Joint Appendices: “JA8-2019” or "JA8-2019-E".	Staff finds that duplicating marking requirements stated in JA8 in this Table would not be appropriate, noting that redundant statements regarding marking proved to be problematic in the 2016 regulations. Staff will instead add a description of the marking to the Compliance Manual.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	Table 150.0-A: Exclude closets from being included with drawers and cabinetry, and require closets to have high efficacy sources.	Staff has specified "linen closets" rather than "closets other than walk-in closets" for clarity. Staff finds that linen closets provide a nearly identical service to cabinets and drawers, and that in all cases the general lighting of the space that the drawer, cabinet or linen closet opens into will be provided by high efficacy lighting. Staff therefore does not find that requiring the additional lighting occasionally provided in these contexts to meet JA8 criteria would be appropriate (noting that this lighting is by definition low duty cycle and low output, and similar to nightlights, path lights and step lights is intended primarily as an aid to navigation).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	Table 150.0-A: Strike item 8 in Table 150.0-A and move it to the beginning of Section 150.0(k) as an exception to the high efficacy lighting requirement.	Staff has moved this provision to Section 150.0(k)1I, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	JA8.4.4(a): Explicitly require Color Rendering Index (CRI) and Individual Color Score requirements in Title 20.	Staff has added language to JA8 to allow lighting subject to a Title 20 Color Rendering Index requirement to demonstrate compliance with JA8 by complying with its Title 20 standard, consistent with the commenter's request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	JA8.4.4(c): Reinstate the 2016 JA8 correlated color temperature requirement of no greater than 3000 Kelvin maximum Correlated Color Temperature (CCT) for separable sources. Two rationale for maintaining a 3000K limit. First, the majority of residential lighting in new construction is selected by builders, not homeowners. Second, if new homeowners are given higher CCT lighting and they don't like it, there is a risk they will replace it with low-efficacy sources with CCT closer to 2700K.	Staff finds that 4000K lighting is allowed by the existing (2016) language and is applicable to all non-screw-base lighting products (including dedicated recessed downlights). Staff does not find any evidence that this allowance has caused the problems described by the commenter; staff notes that 4000K represents a neutral white, whereas higher color temperatures represent lighting with a blue appearance. Staff additionally notes that LED products are commonly labeled with color temperature, enabling selection of a low CCT product without resorting to alternate lighting technologies.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222626	CASE Team	JA8.8: Modify Section JA8.8 to specify that luminaires and other products covered by the ENERGY STAR Luminaires v2.0 Specification and have completed the life testing in that specification, would also be marked “JA8-2019-E”.	Staff has updated the JA8 marking requirements to allow use of the "-E" by fully integrated luminaires, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222626	2/20/2018
222627	CASE Team	In addition to the nonsubstantive revisions to the code language, the Statewide CASE Team recommends VENs be “certified” to OpenADR 2.0a or 2.0b. (see page 5)	Staff has added the word "certified", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222627	2/20/2018
222627	CASE Team	In addition to the nonsubstantive revisions to the code language, the Statewide CASE Team recommendsCloud-based Virtual End Nodes (VEN) be allowed. (see page 4)	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222627	2/20/2018
222627	CASE Team	The Statewide CASE Team has provided the Energy Commission with recommendations to revise the DR language to improve readability and clarity without changing the requirements as presented in the 45-Day Language. (don't know what this refers to but it its relevant it should be docketed)	Staff has revised the requirements of Section 110.12 for readability, consistent with the commenter's suggestion. (Staff did not find that all of the specific edits suggested by the commenter improved readability, and staff made further modifications to the associated sections in addressing other substantive comments.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222627	2/20/2018

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222627	CASE Team	[T]he Statewide CASE Team recommends altering the language so that the requirement is not limited to cooling towers connected to chilled water plants. The proposal showed that cooling towers at higher efficiency are cost-effective, so the language should be modified to apply to all cooling towers 900 gpm or greater.	Staff finds that discussions with stakeholders centered on chilled water plants, and that the CASE report is explicit in recommending language that applies specifically to chilled water plants. Staff therefore feels that extending the scope of the requirement beyond what was presented to and discussed with stakeholders would not be appropriate; staff finds that extending the scope of the requirement can be appropriately presented, discussed and considered as a part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222627	2/20/2018
222627	CASE Team	The Statewide CASE Team recommends the Energy Commission consider the cost-effectiveness of 80 gpm/hp cooling towers in future code change proposals.	Staff will continue to examine cooling tower efficiency improvements as a part of its future code cycles.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222627	2/20/2018
222628	CASE Team	Eliminate all mandatory requirements related to filter pressure drop and size, and rely on the verification of fan efficacy to ensure that all system components, not just filters, are properly designed and installed.	Staff does not find that the change proposed by the CASE team to eliminate requirements related to filter pressure drop and size would be appropriate. A single variable analysis removes the ability to diagnose faults, as the ability to isolate specific performance variables is lost. Staff additionally finds the conclusions stated in the Comment Letter and Appendix E to be incorrect. Ref: Staff Analysis of Air Filter Pressure Drop and Air Filter Sizing (April 2018). https://efiling.energy.ca.gov/getdocument.aspx?tn=223260	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222628	2/20/2018
222628	CASE Team	In Section 150.0(m)12Bii, prescribe a design maximum filter pressure drop of 0.15 inch w.c. and a maximum velocity of 225 feet per minute (fpm) instead of 150 fpm.	Staff notes that this recommendation is contradictory to the CASE team recommendation to eliminate aif filter sizing requirements. The CASE team asserts that properly designed space conditioning systems should use 0.7 inch w.c. as the design static pressure. Staff finds that 0.5 inch w.c. is the typical rated cooling speed static pressure for residential furnaces. Laboratory testing of gas furnaces was performed by the CASE team and the results were reported by Proctor Engineering as support for the 0.45 w/cfm fan efficacy proposal for the 2019 Building Energy Efficiency Standards . The performance reported for the 10 gas furnaces tested indicated that if system static pressure was increased from 0.5 to 0.7 inch w.c., the values for fan efficacy for many of the furnaces increased by approx. 0.05 w/cfm, and two of the furnaces increased by approx. 0.1 w/cfm. The energy cost savings from operating at lower static pressure may cover the reoccurring costs of replacement air filters for the life of the system. Staff would therefore not recommend designing space conditioning systems to operate at increased static pressure in order to reduce the face area or depth of air filters.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222628	2/20/2018
222628	CASE Team	Reference the CALGreen mandatory measure for ACCA Manual D sizing in Part 6 Section 150(m)12 to reinforce the requirement.	Staff notes that the CALGreen provision specifies ACCA Manual J, D, or S, "or other equivalent design software or method", as well as having an exception that allows for "use of alternate design temperatures necessary to ensure the systems function are [sic] acceptable." Staff therefore does not find that referencing ACCA Manual D in the noted section would be appropriate, given both the number of available alternatives and the overall complexity of the CALGreen provision.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222628	2/20/2018
222629	Eric DeVito (Stone Mattheis Xenopoulos & Brew, PC)	We SUPPORT the reduced NFRC glazing exemption in § 110.6(a)2 of the Standards for site-built nonresidential fenestration. We can also support elimination of the exemption in its entirety, and we recommend deleting it in the next Standards update.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222629	2/20/2018
222629	Eric DeVito (Stone Mattheis Xenopoulos & Brew, PC)	We SUPPORT the residential fenestration prescriptive values that are included in the component packages in Tables 150.1-A & B, specifically: 0.30 maximum U-factor for the entire state, 0.23 maximum SHGC in climate zones 2, 4 and 6 – 15, and NR for SHGC in the remaining climate zones.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222629	2/20/2018
222630	Elizabeth Blythe (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222630	2/21/2018

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222631	Bryan Olsen (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222631	2/21/2018
222632	Cassandra Trester (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222632	2/21/2018
222633	Dan Granback (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222633	2/21/2018
222634	Craig Blume (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222634	2/21/2018
222634	Shannon Grein (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222636	2/21/2018
222635	Spencer Rosen (Energy Integrity)	Although in conception the HERS testing protocol represents an important series of testing to improve building standards, it has devolved into a "box to check" with ramped fraud and self-interest dominating the landscape. I support the removal of the HERS requirement from new construction solar. Anything that slows down the adoption of solar or incumbers its adoption that is not 100% effective at providing real accountability is not supportive to the building industry at large.	Staff notes that the Express Terms do not propose to require HERS verification of installed solar photovoltaic systems, which is consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222635	2/21/2018

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222637	James Howard (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222637	2/21/2018
222638	Shane Hansen (Green Dinosaur)	I would like to express strong opposition to the CEC's proposal to remove HERS verification of Solar V systems, especially since the CASE report on Solar PV supported HERS verification of PV as a required energy measure.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222638	2/21/2018
222639	Rachel Kuykendall	Recommend altering the language in Sect 10-115 (COMMUNITY SHARED SOLAR ELECTRIC GENERATION SYSTEM OR COMMUNITY SHARED BATTERY STORAGE SYSTEM COMPLIANCE OPTION FOR ONSITE SOLAR ELECTRIC GENERATION OR BATTERY STORAGE REQUIREMENTS) to be more inclusive of non-solar resources. Specifically, "Community Shared Solar Electric Generation System" should be replaced by "Community Shared Renewable Generation System" where the Renewable Generation System must be made up of renewable electrical generation facilities, as defined in California Public Resources Code Section 25741(a).	Staff notes that the provision is with regards to the *location* of solar PV:solar PV systems are normally required to be part of the building (at minimum, located on the same site, and generally expected to be located on the roof), and this provision instead allows for these panels to be located elsewhere provided that the benefit of the panels still accrues to the building's occupants. Consideration of entirely alternative generation technologies is not within the current scope of the rulemaking, nor is sufficient information present in the public record to allow for useful analysis of such an option. Staff therefore invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222639	2/21/2018
222640	Rebecca Heilig (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222640	2/21/2018
222642	Joyce Loper (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222642	2/21/2018

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222643	Krystal Macauley (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222643	2/21/2018
222644	Gina Lombardo (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222644	2/21/2018
222645	CASE Team	The Statewide CASE Team is also proposing to only require verification of capacity for heat pumps that incorporate electric resistance heating to reduce the use of electric resistance heating due to undersized equipment. (see language pages 5-6)	Staff finds that problems created by undersizing of equipment are not limited to problems associated with electric resistance heating, and therefore that limiting verification to units that include electric resistance would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222645	2/21/2018
222645	CASE Team	The Statewide CASE Team is concerned that the language stated in Section 150.2(a)1A regarding additions greater than 700 ft2 meeting the prescriptive requirements in Section 150.1(c), which include QII, may cause a compliance and enforcement challenge. Section 150.1(c) also includes the QII requirements in section 150.1(c)1E. Additions which consist of converting an existing unconditioned space to newly conditioned space may not be able to meet all the QII requirements referenced in RA3.5. These include potential difficulty airsealing the envelope in areas of the existing structure that may be inaccessible, and insulating headers in areas where the header is existing. It is recommended that the QII requirements allow these types of 'newly conditioned' spaces to be successful in a cost-effective way. (see language page 4)	Staff notes that the proposed language expressly states that QII does not apply, satisfying the commenter's concern. (Staff notes that this language was added after a similar concern was voiced for the pre-rulemaking draft of the Express Terms.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222645	2/21/2018
222645	CASE Team	We encourage the Energy Commission to develop default heating capacity values, or a calculation method to determine minimum 47 degrees F and 17 degrees F heat capacity values for heat pumps. This could be accomplished through the compliance software by providing an option to apply default values for heating capacities through an auto-sizing function to develop the capacities and report the default values on the Certificate of Compliance.	Staff notes that this is a comment relating to compliance software and not to proposed amendments to Part 6. Staff has passed this comment on to its software team.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222645	2/21/2018
222646	Robert Shearer	The commenter believes the definition "CLERESTORY GLAZING" is incorrect. Also the new definition does not describe the fenestration product illustrated within the Nonresidential Compliance Manual; nor does it align with the IES description and drawings of "Clerestory". (Section 100.1)	Staff notes that there is a "clerestory" product used to provide skylight, and there is a separate "clerestory" product used to provide sidelighting; the proposed express terms uses the term "clerestory" to refer solely to the second category of sidelighting products. Staff has edited the definition for the term "clerestory" for clarity; staff does not find either the definition or use of the term to be incorrect.	http://docketpublic.energy.ca.gov/PublicDocuments/17-BSTD-02/TN222646_20180221T125429_Robert_Shearer_Comments_CLERESTORY_Definition_Unclear_or_Incorr.pdf	2/21/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222646	Robert Shearer	Any portion of a window above eight feet from finished floor converts the entire window into “CLERESTORY GLAZING” for Daylit Zone definitions and rules of precedence for controlling luminaires. It is recommended that a definition similar to that of a SKYLIGHT be considered for CLERESTORY GLAZING. Such as: CLERESTORY GLAZING is fenestration installed above a roofline greater than or equal to 60 degrees from the horizontal.	Staff has revised the definition of "clerestory" to incorporate the suggested phrasing, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222646	2/21/2018
222647	Rachel Golden (Sierra Club)	Sierra Club recommends that a social cost of carbon option should be available for local jurisdictions that are interested in adopting GHG-based building codes. Sierra Club appreciates that the research version of the CBECC-Res software offers this option; the CALGreen code should reflect this same option.	Staff notes that this comment relates to proposed changes to Title 24 Part 11 that are included in a separate, parallel proceeding; consideration and response to this comment are shown in the record for that proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222647	2/21/2018
222647	Rachel Golden (Sierra Club)	Sierra Club recommends that the CEC include a thermal storage credit in the proposed energy storage credit in the 15 day language.	Staff finds that the CBECC software already provides appropriate credit for some thermal measures; this comment relates to this software rather than the Express Terms. Staff are continually working to improve modeling of efficiency measures in this software. Staff does not find that additional Part 6 language is necessary in order to model thermal storage, and that artificially inflating the effect of thermal storage in order to provide additional credit would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222647	2/21/2018
222647	Rachel Golden (Sierra Club)	Sierra Club strongly supports the addition of an electric water heater baseline in the 2019 code that is available whether or not gas is available.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222647	2/21/2018
222647	Rachel Golden (Sierra Club)	Sierra Club supports the integration of prescriptive requirements for installing solar PV systems.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222647	2/21/2018
222647	Rachel Golden (Sierra Club)	The Sierra Club recommends the CEC update the Building Energy Efficiency Standards to support a transition to energy efficient zero-emission electric residential and commercial buildings. Sierra Club recommends the CEC evolve Title 24 to become a GHG-based code, and to overcome the limitations posed by use of an outdated TDV metric that does not account for the full cost of natural gas (i.e. infrastructure, methane leakage). We recommend the CEC replace or pair TDV with a GHG-based metric.	Staff finds that the commenter's suggestion would not align with current statutory requirements for adopting building energy efficiency standards, and that a change to statute would be necessary to consider the proposed shift in metrics. Efficiency standards must be shown to be cost effective to the consumer based on the marginal dollar costs incurred by or passed on to the consumer and the marginal dollar savings received by the consumer. Substituting societal costs and benefits in place of personal costs and benefits loses the guarantee that consumers will not be financially harmed by the imposed efficiency requirements; while societal costs and benefits are considered by both staff and the Energy Commission in their decisionmaking, statute does not allow this consideration to be made in place of consideration of the direct financial effects to consumers. Staff notes that infrastructure costs are already necessarily passed on to consumers via energy rates and bills. Staff additionally notes that TDV estimates the time-of-use cost of marginal energy demand as these costs will also necessarily be passed on to consumers even under a flat rate structure; TDV or a similar calculation would still need to be performed irrespective of consideration of GHG metrics.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222647	2/21/2018
222648	Alex Bosenberg (NEMA)	Rebuttal to arguments against NEMA 77. NEMA concludes that the Commission is not bound by anti-backsliding principles when it comes to flicker, and the Commission may allow our proposal to accept NEMA Standard 77-2017 as an alternative test method and requirements for JA8/JA10 compliance regarding flicker.	Staff finds that the concerns surrounding use of NEMA 77 are sufficient to warrant additional time for discussion and analysis, and that adopting a provision allowing use of this standard in place of JA10 would not be appropriate at this time.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222648	2/21/2018
222648	Alex Bosenberg (NEMA)	We request that NEMA Standard Publication 77-2017 “Temporal Light Artifacts: Test Methods and Guidance for Acceptance Criteria” be reinstated as it appeared in pre-rulemaking language as a method for qualifying products to Title 24.	Staff finds that the commenter is conflating the specification of a test procedure versus a standard. Staff, in considering the use of the NEMA 77 test procedure during the pre-rulemaking period, did not propose any change to the existing flicker standard. Two proposed NEMA 77 values (a Pst and an SVM of 1.0) were solely based on ensuring that the existing standard would be met or exceeded by devices using the NEMA 77 test procedure, thereby ensuring equivalency. Staff received pre-rulemaking public commentary that raised concerns about both this approach and the use of NEMA 77 generally, and for this reason staff are not proposing inclusion of NEMA 77 in this proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222648	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222649	Kyle Pitsor (NEMA)	NEMA proposal: Remove the specific list of space types in this exception and allow remotely-located manual area control devices with annunciation for safety and security reasons as determined by the building designers and in agreement with the AHJ. Proposed language: "EXCEPTION 1 to Section 130.1(a)2: For ~~psychiatric and secure areas in healthcare facilities, malls and atria, auditorium areas, retail merchandise sales areas, wholesale showroom areas, commercial and industrial storage areas, general commercial and industrial work areas, convention centers, and arenas,~~ reasons of safety and security the manual area control may instead be located so that a person using the control can see the lights or area controlled by that control, or visually signal or display the current state of the controlled lighting." Exception to Section 130.1(a)2	Staff finds that the phrase "reasons of safety and security" is too vague to be enforced and would ultimately result in the inclusion of manual controls becoming fully discretionary, contrary to the intent of Section 130.1(a). Staff has instead specified "and other areas where placement of a manual area control poses a health and safety hazard" to provide flexibility for cases where relocation of controls is necessary to avoid a specific, documentable hazard.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	NEMA proposes this text be added as a new item 130.0(c)6C and the proposed item 6C from the 45-day express terms be re-designated as item 6D: "For systems that also provide power to equipment other than lighting, the wattage shall be the labeled maximum wattage of the system power supply reduced by the wattage of the non-lighting equipment connected to the system."	Staff has added an Exception to Section 130.0(c)6 for power-over-Ethernet systems supplying power for installed non-lighting devices, consistent with the commenter's suggestion. Staff does not find that a nonspecific exception would be appropriate as it would create a potential for gaming and conflict with the ordinary treatment of the power distribution system.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	We recommend that a new Section be added titled "Alternative Approaches" that provides a simplified path to compliance for High Efficiency Lamps and Luminaires. The JA8 reporting requirements can be simplified to a confirmation that the lamp or luminaire certified to and listed in the ENERGY STAR qualified products list. Alternative JA8 Approaches: Alternative 1: LED lamps that are certified as ENERGY STAR Lamps can qualify as an alternative to lamps that comply with JA8 requirements. In addition, LED lamps that are certified as meeting the California Title 20 appliance standards can qualify as an alternative to lamps that comply with Appendix JA8 requirements. Alternative 2: LED Luminaires that are certified as ENERGY STAR Luminaires can qualify alternative to luminaires that comply with JA8 requirements.	Staff has aligned overlapping JA8 and T20 requirements and updated references to ENERGY STAR specifications, consistent with the commenter's suggestion. Staff notes that compliance with JA8 already includes and specifies compliance with referenced federal and State standards and with referenced ENERGY STAR specifications; as such, the commenter's proposal would have the effect of eliminating requirements that go beyond T20 and ENERGY STAR specifications. Staff finds that this would be contrary to the stated purpose and justification for including these specifications in JA8 (as documented in the associated prior rulemaking proceedings) and therefore does not find doing so to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Although NEMA agrees with CEC's effort to list OpenADR standards in attempt to clarify the method for which the demand control signal must conform, we do not agree with paragraph 2 as written, which would limit the communication protocol used by the system within the building. How the demand response signal is propagated or transmitted within a given building system after the internet web service signal is received by the OpenADR Virtual End Node (VEN) should be the decision of the building owner and the manufacturer providing the system.	Staff has rephrased the communication requirement to ensure it is agnostic with regards to the use of additional communication protocols, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222649	Kyle Pitsor (NEMA)	NEMA recommendation: Modify 110.12(a)1 and strike draft paragraph 110.12(a)2. "(a) Demand responsive controls. 1. All demand responsive controls shall be capable of communicating with an OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification. ~~2. All demand responsive controls shall be capable of using one or more of the following for communications that occur within the building: Wi-Fi, ZigBee, BACnet, Ethernet, or hard-wiring.~~ 2~~3~~. When communications are disabled or unavailable, all demand responsive controls shall continue to perform all other control functions provided by the control."	Staff has revised the language of this Section to include an option for a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 110.9: NEMA supports moving the Lighting Controls requirements back into Title 24 from Title 20 with the caveat that these same requirements must be removed from Title 20 to prevent confusion and potential conflict if/when changes were ever made to one and not the other.	Staff appreciates the comment of support, and will work with Appliance program staff to pursue removal of redundant T20 language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	The list in paragraph (a)2 is a mix of communication protocols and physical layers and is missing other open communication protocols used in the building industry.	Staff finds that the list of protocols serves as a minimum standard, and thus is not intended to be a comprehensive. In addition, not every protocol is suitable as a broad minimum standard nor able to ensure a minimum, expected level of interoperability. To the extent that the commenter has specific additional protocols they feel would be appropriate to specify as a minimum standard, staff invites the commenter to submit a code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.1(a) Manual Area Controls: Exception 1 to Section 130.1(a)2 should not be restricted to only the space types listed in the current Title 24 Standard, and should be applied more broadly to spaces appropriately determined by the building architect, designing professionals and Authority Having Jurisdiction (AHJ). There are other space types where remotely mounted and annunciated lighting controls are well applied for security and safety. Additional application spaces are libraries, warehouse aisles, exercise gyms, lobbies, child care facilities, locker rooms, dressing rooms, labs, etc.	Staff does not find that making these requirements fully discretionary would be appropriate, given that it would make the provision unenforceable (or open AHJs up to accusations of arbitrary enforcement). Staff has instead expanded the list of spaces where this approach may be used, and specified "and other areas where placement of a manual area control poses a health and safety hazard" to provide flexibility for cases where relocation of controls is necessary to avoid a specific, documentable hazard.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.1(c)4 Shut-OFF Controls: NEMA agrees with the CEC Staff Supplement TN 222482 which indicates the CEC will include a Manual-ON option for areas using automatic time-switch Shut-OFF control. We agree with this action.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.1(d) Automatic Daylighting Controls: NEMA agrees with the CEC addition of this exception to further clarify proper applicability of automatic daylighting controls. Additional clarity may still be possible, such as more clearly explaining the term "overhang rise" in Exception 2 to Section 130.1(d)	Staff appreciates the comment of suppport; staff has added a definition for "overhang rise" consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.1(f)4 – Control Interactions. NEMA supports these additions to the requirements for controls interactions, which we believe will clarify this topic and improve compliance. We do recommend one change should be made, as indicated below: "4. The multi-level lighting control shall permit the demand responsive control to ~~increase or decrease~~adjust the lighting during a demand response event and to return it to the level set by the multilevel control after the event."	Staff has replaced the phrase "increase or decrease" with the word "adjust", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222649	Kyle Pitsor (NEMA)	Section 130.2(c)3 Controls for Outdoor Lighting: The 45-day express terms removed the 1500 W maximum zone requirements for luminaires controlled by motion sensing. We request that the CEC Staff rationale for removal of this provision be provided, as we were unable to find the rationale in the CEC Staff Supplements on Outdoor Lighting Controls.	Staff has restored the 1500w limit, consistent with the commenter's suggestion. (Staff's original rationale was that the existing language could be read to require completely independent and redundant controls, rather than requiring that the controlled lighting be zoned. The returned language is rephrased to ensure that centralized, zoned controls providing the same benefit can be used to meet this Section's requirements.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Alternate Approach to JA8 Qualification: NEMA notes that California Title 24 requirements for lamps and luminaires continue to move closer to ENERGY STAR and/or Title 20 requirements. As there are now very few performance differences, and no meaningful energy-use differences, in a product complying with these multiple standards NEMA requests the CEC consider simplifying the Title 24 compliance approach.	Staff notes that several of the proposed changes serve to more closely align JA8 and T20, consistent with the commenter's suggestion. Staff will continue to pursue alignment over future code cycles, noting that some aligning changes will occur in T20 rather than in JA8.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 110.12(c) Demand Responsive Lighting Controls: This clause can be improved to clarify that the 15 percent reduction in lighting power is a requirement only for compliance with the acceptance testing to prove capability but not a specific mandatory reduction level. NEMA proposes the CEC replace the word “compliance” with “acceptance testing.”	Staff has amended this language to refer to "compliance testing"; staff is intentional in avoiding the use of the phrase "acceptance testing" in order to avoid extended reference to the Nonresidential Appendices and preserve the readability of the provision. Staff has otherwise relocated and rephrased the provision for clarity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Joint Appendix 8, JA8: JA8.3.6 / 8.5 Elevated Temperature Life Test / Marking: We commend the Energy Commission on its decision to remove the elevated temperature test from JA8.3.6 in favor of alignment with ENERGY STAR requirements and adherence to the ENERGY STAR Lamps Specification Version 2.1.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Joint Appendix 8, JA8: JA8.4.2 Power Factor: “Rated Wattage” and “Nominal Wattage” are common industry terms. NEMA proposes that CEC change the wording “nominal rated wattage” in this section to “rated wattage” for clarity and alignment with industry practice.	Staff does not find that the phrase "nominal rated wattage" occurs in this Section; staff considers the language as proposed to satisfy this request.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Joint Appendix 8, JA8: JA8.4.2 Power Factor: We note that the ENERGY STAR program allows a power factor of 0.7 for most lamps, and 0.6 for small lamps <10W. NEMA proposes the CEC align the power factor requirements of JA8 with the ENERGY STAR Lamps program.	Staff finds that reducing the power factor requirement has the potential to increase energy consumption, and that for this reason a complete code change proposal that discusses the anticipated energy impacts, benefits, and costs would be necessary to consider the requested alignment. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Joint Appendix 8, JA8: JA8.4.4 Color Rendering: NEMA continues to oppose mandatory 90 CRI requirements and R9>50 for all low-rise residential applications as well as in the Title 20 Appliance Standards.	No change is proposed to the CRI 90 and R9 of 50 requirement for low-rise residential applications; staff notes that the justifications for these values are documented in the prior rulemaking proceedings under which they were adopted. Staff is not reopening a discussion of these values as a part of this rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.0(c)4 – Luminaire Classification of Power: These changes (shown in strike out / underline) should be made for clarity: “4. For inseparable SSL luminaires, the maximum rated wattage shall be the maximum rated input wattage of the SSL luminaire as specified in Section 130.0(c)1 when tested in accordance with UL 1598, 2108, 8750, or IES LM-79.”	Staff has revised this provision to include this phrase, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018
222649	Kyle Pitsor (NEMA)	Section 130.0(c)6 - Luminaire classification and power: The additions to (c)1-6 can be further improved to incorporate recent additions to ASHRAE 90.1 with respect to new modular Power over Ethernet (PoE) systems. NEMA proposes the CEC harmonize with ASHRAE Addendum AH.	Staff finds that Power over Ethernet (PoE) switches can provide power to non-lighting related devices and loads and have added an Exception that allows this power to be subtracted from calculation of the lighting load, consistent with the commenter's suggestion. Staff finds that specifying "*installed* non-lighting devices" best comports with the intent of Section 130.0, and does not find that allowing speculative subtraction of power from the calculation would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222649	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222650	Lorena Pichardo (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222650	2/21/2018
222655	Jackson Chin (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222655	2/21/2018
222656	Jackson Chin (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222655	2/21/2018
222657	Kim Floyd	I want the CEC to update the code to facilitate a shift off gas to high efficiency all-electric climate friendly buildings. I want the CEC to use a GHG metric for code compliance, not the TDV energy cost metric which is biased in favor of gas/"mixed-fuel buildings." We need the CEC to account for the full costs of gas construction (i.e. costs to extend gas infrastructure and global warming potential of upstream methane leakage).	Staff finds that using a greenhouse gas metric does not determine the amount paid for energy by energy consumers; while greenhouse gas emissions can be considered *in addition to* cost effectiveness, current statute does not allow for adoption of a measure that is not cost effective to the consumer. Thus, staff does not find that consideration of greenhouse gas emission costs would allow for adoption of a regulation without considering direct (i.e., energy bill) costs and savings, and that use of TDV remains appropriate for calculating direct costs and savings (i.e., the effect that use patterns will have on future energy rates and bills, inclusive of GHG costs that are passed on to consumers in their energy bills). Staff finds that natural gas infrastructure costs are appropriate to consider when they would be compelled by proposed regulations; staff notes that the Express Terms proposes to *remove* provisions that compelled inclusion of natural gas infrastructure.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222657	2/21/2018
222659	Thomas J. Phillips (Healthy Buildings Research)	At a minimum, the Title 24 and Cal Green standards should include an Advisory Note in the appropriate sections in order to advise designers, builders, and operators that future climate conditions are expected to change over the life of the building and should be considered in order to provide a healthy, safe, and comfortable building in an energy efficient and low carbon manner.	Staff finds that the advisory note would not have any regulatory effect, nor would it serve to clarify or assist in navigating proposed regulations in Title 24 Part 6 or Part 11 as it does not relate to an existing or proposed regulation. For this reason, staff does not find that incorporating this note into a regulatory section would be appropriate. (Staff will, outside of the rulemaking proceeding, consider whether this or similar direction may be appropriate as the foreword or afterword of a Standards-related publication, or appropriate to include within a guidance document.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222659	2/21/2018
222659	Thomas J. Phillips (Healthy Buildings Research)	We recommend the following additions to Sec. 120.1, Requirements for Ventilation and Indoor Air Quality (Title 24 Residential and Nonresidential Standard, and pertinent sections in Cal Green Standards): 1) Assess Life Cycle Performance for Thermal Comfort; 2) Assess Thermal Resilience During Extended Power Outage; Provide labeling at the building HVAC maintenance access and information in the building operations manual to notify users that the building has the above resilient design features. (see pages 3-5 for details)	Staff finds that this proposal to perform additional assessments and affix additional labeling has the potential to increase costs; staff therefore finds that a cost analysis for the proposed additional measures would be necessary to consider the recommendation. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222659	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222662	Colby Allerton	The CEC is not currently accounting for the full costs of gas construction, such as the potential of upstream methane leakage, overall air quality and health, reliability, and stranded asset risks of gas appliances. The CEC should update the code to facilitate a shift off gas to high efficiency all-electric climate friendly buildings immediately.	Staff finds that the Express Terms facilitates construction of all-electric buildings by providing all-electric compliance paths both for newly constructed buildings and for additions and alterations to existing buildings, consistent with the commenter's suggestion. Staff finds that the current cost accounting is accurate in determining costs to consumers as required to demonstrate compliance with statute. (Natural gas infrastructure costs are appropriate to consider when they would be compelled by proposed regulations; staff notes that the Express Terms proposes to *remove* provisions that compelled inclusion of natural gas infrastructure.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222662	2/21/2018
222663	SEIA and CALSSA	Both SEIA AND CALSSA strongly encourage that the 2019 standards should take California all the way to Zero Net Energy for new homes	Staff finds that the proposed minimum requirements in the Express Terms best serves the Governor's goals in the context of current statutory direction.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.3.1 Minimal Shading Criteria: There should be no arbitrary assessment of future tree heights. Measuring tree heights is arbitrary because they can be trimmed at install, removed over time or grow.	Staff finds that a "worst case" assumption that the resident responsible for the trees is likely to desire that they grow to their full size and height is appropriate; staff is intentional in not creating a situation where the resident would be forced to choose between their solar PV panels and their trees, or be forced to commit extra funds towards maintenance of the trees solely to keep them below a height that shades their solar array.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.3.1 Minimal Shading Criteria: Two-story homes should not require a smaller system size. Again, rather than restricting system size, shade restrictions should be lowered to enable larger systems (with minimal loss of production).	Staff finds that the PV size reduction for two-story homes is modest and necessary to avoid situations for homes with limited suitable roof area where compliance would not otherwise be possible. Staff notes that shading was not a major criteria in developing these reductions; relaxing the minimum shading requirements would have little impact on this issue. Staff therefore does not find that modifying these provisions to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.3.1 Minimal Shading Criteria: Typical chimney is 6ft tall and this requirement would put a 12 feet diameter no go zone around it, again not accounting for MLPE. This would restrict system size for many home owners given the azimuth restrictions and fire setbacks.	Staff finds that the limit is appropriate to prevent the value of the installed panel from being significantly reduced by shading; staff notes that the regulations specify a minimum installation requirement, and it does not make sense to require people to install panels in shaded areas. (Staff notes that the regulations do not prohibit installation of panels in excess of minimum requirements.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.3.1 Minimal Shading Criteria: We concur that setting performance criteria rather than prescriptive constraints for system orientation would provide the great yield in the overall context of solar's benefits to grid harmonization. We do respect, however, that the Commission has indicated its preference to deliver specific requirements for the prescriptive path, leaving other considerations for the compliance path.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.4 Solar Access Verification: It is unclear if the solar HERS verifications will be required if 11.4 is enacted. We believe that confirmation of this would be needed to provide comments on this topic.	Staff finds that solar access verification is necessary to ensure that the system performs as intended and avoid creating a loophole for folks seeking to evade requirements. Staff has provided an additional means of verifying the solar access that may be easier to comply with than the original option. (Staff notes that HERS verification is not required by the Express Terms.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.4 Solar Access Verification: The process of obtaining this data, as well as the administrative requirements for filing will result in higher installation costs since an additional site visit would be requirement to obtain the information. Similarly, this requirement would mandate every solar company to figure out how to build sun eye measurements into their IT systems, processes and procedures, further adding cost without clear value. The design process of a new community accounts for shading from both the roof characteristics and adjacent shading.	Staff has revised and added options to the Solar Access Verification provisions in JA11, including an option for "an alternate method approved by the Executive Director". These options include options that do not include sun-eye measurements as well as methods that can be accomplished without additional site visits.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.4 Solar Access Verification: We would like to reiterate that requirement for Solar Access Verification should be removed as the purpose or use of the data obtained is unclear.	Staff notes that the purpose of solar access verification is to avoid a scenario where Part 6 forces panels to be installed in illogical or nonperforming areas. Staff does not find that removing these provisions (and reintroducing a risk of requiring panels in locations where they will receive inadequate sunlight) would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA11.7 Certificates and Availability: We would like to request more clarification behind this requirement and at what point is the certification / inspection required. It may be that a HERS inspection could address the concerns or this certificate could substitute for a HERS verification.	Staff notes that a Certificate of Installation is completed by the installer to document that the installed equipment conforms to the specifications on the Certificate of Compliance prepared for the building's design; this is common for all building systems, and is not related to veritifcation or acceptance testing. (Acceptance testing, when required, is documented on a Certificate of Acceptance; the Express Terms do not specify additional testing for solar PV systems.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018

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222663	SEIA and CALSSA	JA12.2.3 Control Requirements: Regarding demand response export capability, current DR rules and regulations do not allow for storage export. We agree bi-directional DR should be a future use-case and remain as an optional control strategy, but the capability to export may currently be prevented by both DR rules and non-export relays installed on certain systems over 10kW.	Staff has revised the demand response specifications in Section 110.12 to more clearly state that they represent minimum capabilities and do not serve to limit the inclusion of advanced abilities into said controls, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA12.2.3 Control Requirements: SEIA and CALSSA believe more flexibility is needed in setting the timing requirement. The control requirements will be adequate to ensure grid benefits and that the storage operator is utilizing the device for functions other than for backup capability.	Staff has revised the control requirements to allow additional flexibility for systems seeking the associated compliance credit, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA12.2.3.1 Basic Control: The current language as written would require that the battery can only charge when the PV production is greater than load, and that it must discharge any time the PV production is less than the load. To allow for customer flexibility and other uses of the storage device we suggest a language clarification: To qualify for the Basic Control, the battery storage system shall be installed in the default operation mode to allow charging only from an on-site or community photovoltaic system ~~when the photovoltaic system production is greater than the on-site electrical load.~~ The battery storage system shall prioritize discharge when the photovoltaic system production is less than the on-site electrical load.	The purpose of this specification for the Basic Control scheme is to maximize self-utilization (the use of on-site generation for on-site loads), and avoid situations where the battery causes on-site generation to be exported when it could have been used on-site. Staff finds that the word "prioritize" is vague as well as inadequate to prevent stored energy from being used when on-site generation is available; staff therefore does not find that making this change would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	JA12.2.3.2 TOU Control: The current language for TOU Control could be read to imply that the only charging that's allowed is from grid, and only during non-peak hours. The language should be updated to allow for a TOU optimization schedule that takes into account on-site solar charging: To qualify for the TOU Control, the battery storage system shall ~~allow~~ prioritize grid charging ~~only~~ during non-peak TOU hours, and ~~begin~~ prioritize discharging to the dwelling and/or the grid only during the peak TOU hours. The operation schedule shall be preprogrammed from factory, updated remotely, or programmed during the installation/commissioning of the system.	Staff has rephrased the wording of this section to be less prescriptive, consistent with the commenter's suggestion. Staff's revisions allow appropriate flexibility while ensuring that cost-minimizing is still accomplised; staff finds that the word "prioritize" is vague as well as inadequate to ensure that appropriate cost-minimizing behavior consistently occurs. Staff therefore does not find that using the word "prioritize" would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	Section 110.12 appears to create a requirement to use OpenADR 2.0 for all types of demand responsive (DR) controls for any such technology including that of battery storage systems. While we understand the goals of having one common protocol, we express to the Commission that it is still very early to tie requirements to a specific protocol given that the storage industry itself is relatively new. A mandate on the specific communication protocol, such as OpenADR, may not achieve the intent of facilitating DR at lower costs and complexity.We encourage the Commission to make this section's requirement flexible in communications standard implementation. Therefore, we recommend striking 110.12(a)1 and if necessary, adapt current code language under JA 5.3.1 that provides optionality in open based standards for DR signals to apply to all demand responsive controls.	Staff has added flexibility in the form of allowing a cloud-based VEN, and added language to expressly state that the device is allowed to possess and use additional protocols (provided that it is also able to respond appropriately to OpenADR communications), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	Section 150.1(c)14: The annual electrical usage should be a minimum PV system size requirement, not an "equal to" requirement. PV panels have a discreet amount of electrical output for each panel, so the minimum possible size would be the next whole panel or module that satisfies the annual electrical usage.	Staff has added the phrase "or greater than", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222663	SEIA and CALSSA	SEIA and CALSSA disagree with the provision for multiple dwelling units that would downsize the solar water heating system if a drain water heat recovery system were installed. We recommend retaining the original B(iii) language: A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum solar savings fraction ~~of either a or b below~~ of 0.20 in Climate Zones 1 through 9 or a minimum solar savings fraction of 0.35 in Climate Zones 10 through 16. The solar savings fraction shall be determined using a calculation method approved by the Commission.	A drain water heat recovery system eases the load placed on water heating equipment, which is reflected in the proposed language in the Express Terms. Staff does not find that ignoring this interaction would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	We encourage the Commission to carry through all the way to ZNE goals with the 2019 development cycle so as to maximize the benefits of bringing solar and other renewable energy into the power portfolio of California.	Staff notes that any photovoltaic options considered by the Commission must operate within the NEM and life cycle costing rules, and where there are disagreements between rules and goals the rules take precedence. Attempting to get to a complete zeroing of net energy consumption woud require larger PV systems that are potentially not cost effective or that violate NEM sizing rules (or both). Staff therefore finds that pursuing a complete net zeroing by requiring even larger systems would risk violating applicable rules and, for that reason, would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	We further recommend additional compliance credit for sizing of PV systems greater than the mixed-fuel estimate of electrical usage – when paired with appropriately sized battery storage – especially for the all-electric case.	Staff does not find a justification for oversizing the PV system for compliance with Part 6; for Part 11, the software does allow EDR credit for larger PV systems that are coupled with batteries, which can be used to achieve low EDR targets.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	We recommend a final review of the language in 150.1(b)1 to ensure it does not preclude compliance credit for PV + ESS [demand flexibility] toward a portion of the EE design rating for grid harmonization efforts	Staff finds that the language in the Express Terms permits appropriate consideration of on-site renewable energy and demand flexibility in relation to required EDR targets.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	We recommend the Commission transition the existing PV compliance credit into a PV-plus-storage compliance credit. PV paired with battery storage provides a benefit at the meter that is similar to an efficiency measure.	Staff has incorporated a modest compliance credit for battery storage, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222663	SEIA and CALSSA	We would like to request the following language be added to the requirements to allow for storage to provide other grid benefits: JA11.2.3.5 Flexible Control To qualify for Flexible Control, the battery storage system shall be operated in a manner that increases self-consumption, responds to utility rates, responds to demand response signals, and/or other strategies that align with EDR value.	Staff finds that the proposed language is too vague to be enforced: there is no verifiable target for increased self-consumption, no criteria for how the unit would be expected to respond to utility rates or demand response signals, and no guildelines or criteria for how a strategy would "align with EDR value". Staff therefore finds that adoption of the proposed language would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222663	2/21/2018
222664	Catherine Hackney (SCE)	SCE supports the proposed Code section 150.1(c)14, which prescribes new low rise residential buildings to have PV sizing for all-electric homes that is the same as a mixed fuel home. Assuming that a “mixed fuel” home has gas space heating, water heating, cooking (oven and cooktop), and clothes drying, then the proposed Energy Design Rating (EDR) target and PV sizing is the same for all homes regardless of fuel mix (assuming other criteria such as climate zone, conditioned floor area, etc., are the same).	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	JA12.2.2 “Minimum Performance Requirements” stipulate that a battery storage system has a usable capacity of at least 5kWh. To provide better clarity, this requirement should instead require that a battery storage system has a minimum run-time of 4 hours to allow for providing capacity and any other service that the battery storage system may technically be capable of providing.	Staff finds that batteries are typically rated for capacity rather than run-time, and that run-time of any battery will vary based on the load placed on the battery (which will vary based on several factors in the design of the home, further complicating the verification of battery sizing). Staff finds that the current minimum sizing standard provides comparable benefit while being easier to design, verify and enforce, and therefore retaining the current capacity requirement is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018

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222664	Catherine Hackney (SCE)	JA12.2.3 "Control Requirements" requires a battery storage system to be programmed to first meet the electrical load of the dwelling unit(s). While this requirement is sensible for residential buildings under a Net Energy Metering (NEM) tariff, an exception to this requirement will be necessary for residential buildings under a Virtual Net Energy Metering (VNEM) tariff.	Staff has edited the language of the control strategies to consistently use the term "on-site", and notes that the language in JA12.2.3(b) does not preclude use of battery discharge to meet common area load, or for virtual net metering between dwellings: it only requires that the load from dwellings (in aggregate) be prioritized. Staff therefore finds that the language in JA12.2.3 supports virtual net energy metering of multifamily buildings or campuses in a manner consistent with the quoted CPUC direction without the need for additional exception language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	JA12.2.3 should for residential buildings under VNEM tariff to directly export to the grid without having to meet any on-site electrical load and have all virtually allocated kWh to benefitting accounts count towards compliance.	Staff notes that JA12 specifies criteria for systems seeking a compliance credit; JA12 does not prohibit the use of other control strategies, it merely specifies that alternate strategies will not receive compliance credit within the CBECC modeling software given that they do not provide the same verifiable benefits to the building's overall energy efficiency. Staff finds that grid exports do not provide the types of on-site benefits that are appropriate to account for in the CBECC software, and therefore that allowing export-based control strategies to receive comparable compliance credits would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	Prior to implementing the proposed language in 10-115, it is essential that SCE have the opportunity to participate in any workshops or other appropriate forums that establish methods for the appropriate accounting of offsets for community shared systems to the Energy Design Rating requirements incorporated in the Alternative Calculation Method (ACM) Reference Manual.	Staff notes that this comment is not directed at any proposed changes to regulatory language; staff nonetheless will ensure that SCE is fully notified of all opportunities to participate in future activities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE also notes that it is currently in preliminary stages with the CPUC of addressing community solar and storage under R.15-03-010 San Joaquin Valley OIR. The Energy Commission should ensure those discussions should be well coordinated with any newly proposed building standard language.	Staff notes that this comment is not directed at any proposed changes to regulatory language; staff nonetheless can confirm that they are working closely with stakeholders (including the CPUC) on discussions of community solar programs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE generally supports the proposed language in Joint Appendix 12.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE generally supports the use of OpenADR, and understands and agrees with the intent of Energy Commission under 110.12(a) "Demand responsive controls", which in part seeks to reduce the potential for stranded demand response-compatible assets in a situation where proprietary communications are no longer supported.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE notes that any community shared solar and storage system requirements be aligned with the recent FERC Final Rule on Electric Storage Participation in Regional Markets. The rule removes barriers to participation of electric storage resources in the capacity, energy and ancillary services markets operated by RTOs and ISOs.	Staff finds that the proposed language in Part 1 Section 10-115 ensures that the benefit of the system accrues to the associated dwellings; it allows for the solar generation or storage to be located off-site provided that the associated dwellings benefit from the off-site systems as if they were on-site systems. It does not speak to or conflict with the noted FERC participation model or preclude participation in service markets as described in the FERC Final Rule provided that the benefits of doing so accrue to the buildings as noted.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE recommends that 110.12(a) be clarified to provide more benefit to consumers and the market through certain adjustments. SCE proposes that the standard be broadened by requiring demand response controls to be either certified OpenADR devices or to be enrolled in a utility-administered demand response program which leverages a cloud-to-cloud OpenADR control from the utility. Demand response participation may be suppressed by requiring all demand responsive controls to be capable of functioning as an OpenADR 2.0a or OpenADR 2.0b Virtual End Node. Providing this optionality will give participants the flexibility to install equipment while not potentially suppressing demand response enrollment.	Staff has added Section 120.12(a)1B to allow cloud-based VENs, consistent with the commenter's suggestion. Staff does not find that buildings are likely to be enrolled prior to occupancy or during inspection when compliance with Part 6 is verified, nor is there an easy way for a building inspector to confirm participated in a demand response program. Staff additionally notes that customers tied to a utility-specific protocol may be prevented from participating in other DR programs, such as those provided by demand aggregators. For these reasons staff does not find that adding a participation provision as an alternative for the communications requirements would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018

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222664	Catherine Hackney (SCE)	SCE suggests deleting the words "Demand Response" and "TOU" from JA12.2.3.3 "Advanced Demand Response Control". Broadening this proposed language to the term "advanced controls" would have the same effect without adding unnecessary restrictions.	Staff notes that JA12.2.3.3 specifies requirements that are additional to either Basic Controls (as specified in 12.2.3.1) or Time-of-Use controls (as specified in 12.2.3.2; "advanced demand response controls" may proceed from either baseline, and are not required to be time-of-use controls. Staff therefore finds that the proposed regulatory language provides the flexibility being requested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE supports the proposed changes to Code section 150.0(n)1A. The newly proposed requirements will better support uptake of electric HPWHs, whereby better aligning the building code with the state's aggressive carbon reduction goals.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE supports the proposed Code section 150.1(c)14, which prescribes new low rise residential buildings to have PV sizing for all-electric homes that is the same as a mixed fuel home.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE supports the proposed prescriptive Code compliance option (150.1(c)8Aiii) that introduces a domestic water-heating systems baseline with HPWHs as it is an important step in supporting the state's GHG reduction goals. SCE cautions, however, that this change may negatively impact customers on time of use (TOU) rates unless the customer takes additional steps such as pre-heating or installing larger water tanks. This impact should be considered and monitored going forward.	Staff appreciates the comment of support, and understand the concern for TOU customer. Staff finds that the effect will be minimal given that CBECC modeling using the TDV metric already accounts for the additional costs experienced during high TOU hours; TDV is essentially a time-of-use correction to accurately capture the costs that will be passed on to consumers irrespective of rate structure, and thus staff is confident that this measure will be cost effective even given a non-ideal usage pattern. That said, staff will closely monitor to see if additional changes to this requirement become necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	SCE supports the proposed solar PV qualification standards as detailed in Joint Appendix 11.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	The Energy Commission should clarify how JA12.2.3.1 "Basic Control" language will apply to stand-alone battery systems. A stand-alone battery cannot charge from the grid during off peak hours and then discharge to the grid for NEM credit purposes. However, such a battery could discharge to serve on-site electrical load, as long as the discharge rate does not exceed the on-site electrical load.	Staff notes that JA12 specifies criteria for systems seeking a compliance credit; JA12 does not prohibit the installation of other battery systems, it merely limits which systems are eligible for additional credit based on their modeled impact on the building. Staff finds that the language is clear in specifying that it only applies in this fashion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222664	Catherine Hackney (SCE)	The Energy Commission should consider alternatives to JA12.2.3.2 "Time-of-Use (TOU) Control". Rather than restricting certain operations to peak and non-peak hours, SCE suggests that relying on TOU rates, utility incentives, and other market interventions to influence the operation of battery storage systems that support grid harmonization will be more effective and yield greater benefits to the grid. SCE believes this more inclusive approach may be more effective in galvanizing battery storage system operations to benefit the grid.	Staff notes that JA12.2.3.2 is not required; it is one of four available alternatives for batteries seeking compliance credit, and staff has added the fourth "Alternative Control Approved by the Executive Director" option consistent with requests for flexibility. Staff finds that this approach maximizes inclusiveness while still providing concrete and verifiable specifications for builders.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222664	2/21/2018
222668	Will Armenta (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222668	2/22/2018

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222669	Will Armenta (Ei Group)	I am in favor of the continuation of HERS Raters providing Solar PV inspections for the reasons included in my letter.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff also finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models). Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222669	2/22/2018
222670	Michael Kloah (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222670	2/22/2018
222671	David Patton (David Wilds Patton, L.C.)	Regarding the proposed amendments to the Residential Lighting section of the 2019 T24: The ability to use the EMS to comply with vacancy sense requirements is sometimes the only way to achieve compliance without extensive remodel, especially in cases of retrofit construction. This, again, is not cost neutral. I request that this section NOT be deleted.	Staff finds that the commenter misunderstands the proposed change to this section: this change merges two sequential sections (150.0(k)2G and H) with largely redundant language into a single section that covers use of EMCS to perform any lighting control functions (including dimming and vacancy sensing). Section 150.0(k)2G is revised to state "control" generally rather than "dimmer" specifically and in so doing ensure that an EMCS remains allowed to perform vacancy sensing, addressing the commenter's concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222671	2/22/2018
222677	Steve Dubin (RMax Operating, LLC)	In response to the “Staff Supplement for High Performance Attics,” Rmax strongly disagrees with the proposed change to remove above deck insulation (Option A) and the conclusions that above deck insulation could lead to structural problems The statement by CEC staff that thicker insulation “could lead to structural problems” is not well defined in the CEC statement or via any of the reports that were reviewed. Rmax would appreciate getting a copy of the reference report or documentation that was used to justify the “structural problems” statement. A review of specific information will allow Rmax and others the ability to provide solutions that will mitigate “structural problems”, or determine that there are no reasonable solutions available to mitigate the “structural problems” as specifically defined. Rmax requests that the CEC staff keep above deck insulation (Option A) as a prescriptive path for High Performance Attic compliance. (see pages 3-5)	Staff notes that the documents relied upon for the rulemaking are available on the Energy Commission's website on the pages for the 2019 rulemaking proceeding, as well as in the associated docket. Staff finds that there is not a protocol for safely attaching roof structural elements through roof chord, nor one for preventing structural lateral movements. Staff therefore finds that these concerns warrant the removal of this prescriptive option, noting that future products overcoming these concerns can be installed using the performance approach to compliance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222677	2/22/2018
222678	Steve Dubin (Rmax)	The California Energy Commission should not allow PV, an energy generation technology to offset envelope insulation, an energy reduction technology.Rmax supports minimum requirements for PV installations but they should not be tied to elements in the building envelope. Therefore, Rmax supports the removal of the PV Credit as identified in the CASE Report.	Staff notes that the compliance credit for photovoltaic systems is replaced by a prescriptive minimum requirement for solar PV, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222678	2/22/2018

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222678	Nicholas Rugulo (Ecogreen Solutions)	It is also proposed to remove the"< 50% LPA'' exemption for mandatory controls; because these controls would be considered "code", they would get the customer no additional savings and would effectively only inflate project costs without getting the customer any additional incentives or financing.	Staff notes that the documents relied upon for the adoption of lighting control requirements found the controls to be cost effective; staff therefore does not find that striking cost-effective efficiency measures for the sole purpose of potentially qualifying for monetary incentives to be either necessary or appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222683	2/22/2018
222678	Nicholas Rugulo (Ecogreen Solutions)	it is our opinion, and has been our experience, that LED technology is not implemented widely enough in existing buildings for the LPA baseline to assume that LEDs are installed. Analysis of several our projects based on the proposed LPA changes has shown that we would see an average 76% cut to the kW demand savings, and a 53.4% cut to the kWh savings. (see pages 3-5)	Staff finds that the lighting power allowances in the Express Terms will cause the adoption of efficient lighting into existing buildings engaging in alteration projects, rather than leaving the installaton of energy efficient lighting as a discretionary action. Prices on LED equipment have rapidly fallen, meaning that rebates are less and less necessary for there to be a strong economic incentive to upgrade a lighting system. Staff does not find that permitting inefficient lighting in order to ensure that incentives are necessary to encourage use of efficient lighting would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222683	2/22/2018
222678	Nicholas Rugulo (Ecogreen Solutions)	LPD values outlined in the draft document are too aggressive and will have a dramatic negative impact on both efficiency projects as well as utility programs; in addition to these changes, removal of the "< 50% LPA'' exemption for mandatory controls will further exacerbate the negative impact that will be directly felt by utility customers.	Staff finds that the control requirements in the Express Terms retain the "< 50% LPA" specification referred to by the commenter: projects may still avoid a need for multilevel, daylighting and demand responsive controls by installing less than the total power allowance, or by reducing the installed lighting power by a sufficient fraction. Staff does not find that the proposed requirements are demonstrated to cause less efficiency to occur in existing buildings.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222683	2/22/2018
222678	Nicholas Rugulo (Ecogreen Solutions)	The mandatory controls, in conjunction with the proposed LPA changes, would effectively force customers to choose between a comprehensive project, selecting a portion of their facility to get up to code with mandatory controls, or more likely would kill the project entirely because the customer would not qualify for OBF nor have appetite to fully fund the project out-of-pocket.	Staff notes that replacement of screw-base and linear fluorescent and incandescent lamps with drop-in LED replacement lamps can be performed without a building permit, and thus without needing to update installed controls; staff does not find that the proposed lighting power allowances would cause building operators to forego lamp replacement or to select non-LED lamps over LED lamps (in cases where the operator does not desire a more comprehensive project).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222683	2/22/2018
222688	Richard Weinert (HCD)	Section 110.10(b)(1): This section proposes a definition for “Potential Solar Zone Area.” For consistency with code format, this definition should also be included in Section 100.1(b) Definitions.	Staff finds that a definition of Solar Zone is already present in Section 100.1(b) Definitions; staff does not find that a separate definition of "potential solar zone" is necessary as the term "potential" is used with its ordinary meaning, and finds that the noted calculation to determine how much of the roof area is potentially able to be designated as a solar zone is most appropriately specified in Section 110.10.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 110.12: This is a new section addressing mandatory requirements for demand management. The leading sentence for this section states, “Buildings, other than healthcare facilities, shall comply with the applicable requirements of Sections 110.12(a) through 110,12(d).” It is implied that this section applies to all buildings, without exception. Is this the intent of this section?	Section 110.12(b), (c) and (d) specify the circumstances where demand responsive controls are required, and Section 110.12(a) specifies general requirements applicable to the controls themselves. Thus, the Section's applicability is not dependent on building type, but on the factors specified in Section 110.12(b), (c) and (d).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 110.5: This section seems to allow any natural gas system fireplace to be installed if it does not have a continuously burning pilot light. It does not correlate with HCD requirements in CALGreen that mandate direct-vent sealed gas fireplaces.	Staff notes that this Section does not state or imply that no further standards, specifications or restrictions apply to the listed equipment, and that the other equipment listed has additional standards in subsequent sections. Staff finds that including "indoor and outdoor fireplaces" on this list is appropriate and consistent with language in several areas specifying that the equipment shall not have a standing pilot light.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 120.1(b)(1)(C); and Section 120.1(c): A substantial difference exists between new construction and existing dwellings units that may be subject to these proposals: the costs to existing units should be separately identified.	Staff finds that (for existing buildings) these provisions only apply to "entirely new or complete replacement space-conditioning systems" where the marginal cost of including a larger or deeper grille with an eficient filter is the same as for newly constructed buildings. Staff therefore does not find that separating these costs is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 120.1(b)(1)(C); and Section 120.1(c): HCD questions whether the requirement to specify a thickness is necessary given that a specific filtration efficiency is also required.	Staff notes that the two-inch depth requirement does not depend on, and is not influenced directly by, the proposed MERV 13 rating requirement but is proposed in order to make possible greater airflow rates at lower pressure drops through the space conditioning system air filter(s), which are realized regardless of the MERV rating of the filter installed in the system. That said, staff has added a performance-based option for filter grille sizing that allows use of a one-inch filter, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018

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222688	Richard Weinert (HCD)	Section 120.1(b)(1)(C); and Section 120.1(c): These proposals for increased filter efficiency also need to address any increased costs resulting from requirements to upgrade HVAC systems in order to effectively use MERV 13 filters,	Staff finds that HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone - any more than by use of other air filters in the range of MERV 6 through MERV 13. MERV ratings do not determine the pressure drop of a filter: pressure drop does not correlate with MERV in that range, but it does correlate to total surface area of the filter medium (which is a product of the number and depth of pleats in the filter, which is why two-inch depth filters generally have superior performance to one-inch depth filters). For this reason, staff finds that if an HVAC system has sufficient static pressure capacity for use of MERV 6 air filters, then the same system will also have sufficient static pressure capacity to use MERV 13 air filters. Use of MERV 13 filters does not affect the availability of air-handling units any more than does the use of MERV 6 filters. Instead, staff finds that the filter manufacturer's pressure drop performance information must be known (as information distinct from its filtration efficacy) in order to select filter products that have pressure drop characteristics that meet the specifications of the HVAC system designer or the HVAC system manufacturer (as applicable).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 120.1(b)(2)(A)(v) refers to "multifamily attached dwelling units" which is a term not used in the other building standards. Is this a different structure from the the "attached dwelling units" referenced in Section 120.1(b)(2)?	Staff finds that ASHRAE 62.2 draws the distinction between multifamily units that share ceilings and floors (multifamily attached), vs those that only share walls (horizontally attached). Staff revised the terminiology in the 15 day language: for high-rise residential, the requirements that applied to horizontally attached dwellings were deleted, thus use of the term horizontally attached dwelling unit has been eliminated, thus attached dwelling unit is now used.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 1302(b)(1): This section provides a reference to Title 24, Part 11 (CALGreen), Section 5.106 for compliance. It should be noted that Section 5.106 is adopted by the California Building Standards Commission and is not applicable to residential structures. The BUG parameters are included in CALGreen Section A4.106.10 Light pollution reduction, however, this is a voluntary section and not mandatory unless adopted by local agencies as applicable for their jurisdiction. HOD recommends that high-rise residential and hotels/motels be exceptions to the requirements of Section 130.2 as referenced to CALGreen Section 5.106.	Staff notes that the outdoor hardscape and parking lot lighting of high-rise residential and hotel-motel buildings is considered nonresidential lighting (and subject to the noted BUG requirements); the provisions of Section 130.0 that allow compliance with residential requirements are applicable to lighting within the dwelling and building-attached lighting controlled from within the dwelling (i.e., porch and balcony lighting). Staff has added an exception for Section 130.2(b) to match the language in Section 130.0(b)2, consistent with the commenter's suggestion; staff does not find that excepting the hardscape or parking lot lighting from BUG requirements would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 140.4(b)(2): This section should be checked for conflict or duplication against building standards in the 2018 International Building Code, Chapter 12, which will be adopted as the 2019 California Building Code, for temperature control and equipment systems.	Staff has reviewed the noted standards and does not find that they coflict with the language for Section 140.4(b)2, or that they provide unnecessary duplication.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 150.0(i): Since Section 1102(c) proposes that the setback thermostat apply to all heating or cooling systems, should 'unitary" also be deleted from Section 150.0(i)?	Staff has removed the word "unitary" where it appeared, consistent with the commenter's suggestion	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 150.0(m)(1 2)(B)(v) and I 500((m)(1 2)(C): See Comments for Section 122.1(b)(1)(C) and Section 120 1(c).	Staff notes that the two-inch depth requirement does not depend on, and is not influenced directly by, the proposed MERV 13 rating requirement, but is proposed in order to make possible greater airflow rates at lower pressure drops through the space conditioning system air filter(s) regardless of the MERV rating of the filter installed in the system. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone - any more than by use of other air filters in the range of MERV 6 through MERV 13. MERV ratings do not determine the pressure drop of a filter. If an HVAC system has sufficient static pressure capacity for use of MERV 6 air filters, then the same system will also have sufficient static pressure capacity to use MERV 13 air filters. Use of MERV 13 filters does not affect the availability of air-handling units, any more than does the use of MERV 6 filters. However for any filter chosen, the filter manufacturer's pressure drop performance information must be known in order to select filter products that have pressure drop characteristics that meet the specifications of the HVAC system designer, or the HVAC system manufacturer as applicable.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222688	Richard Weinert (HCD)	Section 150.1(c)(12)(A): The requirement for a whole house fan bringing in air directly from outdoors seems contradictory to the requirement for a MERV 13 filter for filtering contaminants.	WHFs bring outside air into the dwelling, and also exhaust air from the dwelling as do other exhaust fans such as bathroom exhaust fans and kitchen range hoods that are used to comply with IAQ mechanical ventilation requirements. Use of a WHF is not a mandatory requirement, but is an optional energy saving cooling measure made available in some climate zones for prescriptive or performance compliance. WHFs should not be operated when outdoor air contains high concentrations of harmful outdoor air pollutants. Dwelling unit windows and doors should also not be opened for purposes of bringing in ventilation air during periods when outdoor air contains high concentrations of harmful pollutants. It is possible that harmful outdoor air particulates may be generated during periods of the day that do not coincide with periods of operation of WHFs that operate only during the cooler hours at the end and beginning of a day, or during the nighttime hours. During periods of the day when outdoor air may contain high concentrations of harmful air pollutants, ventilation systems that use MERV 13 filtration of outdoor air brought directly into the dwelling, and space conditioning systems that provide MERV 13 filtration of recirculated air should be used to ensure adequate indoor air quality	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 150.2(b)1(H)(iii)(b): This section should include some consideration if a voluntary photovoltaic system has already been installed prior to the altered or replacement water heater. An additional 1 kW should not be required depending on the size of the existing photovoltaic system.	Staff has removed the requirement for additional PV from this section; this resolves issues of evaluating the presence and sizing of existing PV systems and of determining a required "margin" of additional panels, and in this way addresses the concern noted by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section100.1: This section includes definitions for habitable space" and occupiable space' which reference spaces as occupied occasionaHy and for short periods of time. Occassional occupancy and short periods of time are relative terms and may be subject to different interpretations. The California Building Code defines "habitable space" and "occupiable space" without reference to degree or time occupied. As part of the California Building Standards Code, these terms should be consistent for code user interpretations.	Staff finds that the proposed updated definitions for "habitable space" and "occupiable space" add specificity and create internal consistency that the definitions in the California Building Code lack.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Sections 100.0(a)(3)(c) and 100.0(e)(2)(D)(ii)(b): The 2019 proposai deletes these exceptions from the referenced sections impiying that the excepted structures will be subject to performance or prescriptive methods of compliance. In order to accommodate the variability in construction methods and materials for limited-density rural residential dwellings, HCD has incorporated many exceptions throughout the California Building Standards Code. A fairly comprehensive exception is in the 2016 California Residential Code, Section R301 11.1 (attached) which will be carried forward into the 2019 California Residential Code. These sections should be clarified on whether the proposed deletion of Section 1 000(a)(3)(c) will subject limited-density owner-built rural residential structures to the performance or prescriptive requirements of the 2019 Energy Code. Clarification would also be appreciated in the 2019 Residential Compliance Manual.	Staff notes that the Exception to Section 100.0(a)3C is now embedded in the definition for directly conditioned space, and is included in the Scope by deleting the reference to mechanical heating and cooling; the change effectively merges subparts B and C. The Exception to 100.0(e)2Dii was removed as it could be read as applying to any building with a fireplace and a sufficiently large photovoltaic system. Staff notes that the specification of Residential Group R in Part 2 Section 310.1 appears to exclude buildings subject to the alternate provisions for owner-built rural dwellings specified in Part 2.5 Section 301.1.1.1, which would have the effect of excluding them from the Part 6 definition of "low-rise residential building" (thereby making the Exception to Section 100.0(e)2Dii redundant).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Table 4.3.11: The thermal requirements of Table 4.3.11 may be contrary to the limited sound structural requirements for these structures per Chapter 1, Subchapter 1, Article 8, of Title 25, California Code of Regulations, commencing with Section 74. HCD recommends that the provisions for limited density, owner-built, rural dwellings be discussed in the Residential Compliance Manual to inform the code user of these types of dwellings and building code provisions.	Staff notes that Table 4.3.11 does not specify *requirements* for log home walls, it specifies *assumptions* used for such walls when performing energy calculations. The Introduction to JA4 reads as follows: "The values in this appendix must be used for all residential and nonresidential prescriptive compliance calculations. California Energy Commission approved compliance software may make adjustments to the values in these tables using procedures described in this appendix." Additionally, staff notes that Part 6 is not applicable to buildings regulated under Title 25 rather than Title 24. Staff therefore does not find that the Table or its associated Section conflict with Title 25 requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018

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222688	Richard Weinert (HCD)	Table 4.3.12: The description below the table indicates that the requirements may be optional. However. HCD adopted Appendix S Strawbale Construction in the 2016 California Residential Code. In fact, the 2018 International Residential Code (IRC). Appendix S, Section AS1O8. requires R-values of strawbales to be R-1 .55 per inch of bale thickness with the bale laid flat: and R-1 .85 per inch of bale thickness with the bale on edge. Since HOD will be adopting the 2018 IRC, these values should be compared with the values in Table 4.3.11 to verify whether they are consistent; or an acceptable higher optional standard for the 2019 codes,	Staff finds that calculation using the IRC-specified R-values and standard hay bale widths of 16 in. or heights of 19 in. produce results that match the specifications listed in Talbe 4.3.12. Staff thereforefinds that this Table is consistent with the noted IRC specification.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	The California Building Standards Law, specifically Health and Safety Code Section 18930(a), requires building standards to meet specified criteria for approval by the California Building Standards Commission. Section 18930(a)(1) requires that proposed building standards do not conflict with, overlap, or duplicate other building standards. Therefore, HCD recommends that the Energy Commission also evaluate building standards in the 2018 model codes (International Code Council Building, Residential and Existing Building Codes; and International Association of Plumbing and Mechanical Officials Uniform Plumbing and Mechanical Codes; National Fire Protection Association NPA 70) for possible conflicts in requirements. Some example sections that may have conflict or duplication with other codes include ventilation requirements proposed in Section 120,1(b)(2), opening sizes in Section 120.1(c)(2)(B), minimum ventilation rate in Table 120.1-B, indoor design conditions for temperature in Section 140.4(b)(2) and other sections noted, but not limited to, in this comment letter.	Staff has reviewed the noted sections and worked with HCD and CBSC to remove conflict, consistent with the commenter's suggestion. (Some of the amendments to remove conflict are proposed to other Parts of the California Building Standards Code and included in separate rulemaking proceedings.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222688	Richard Weinert (HCD)	Section 150.0(k)(3)(B): Since the Energy Code does not define 'multifamily." does 'multifamily include 3 or more dwelling units as used in other parts of the Energy Code with the exception of this case?	Part 6 uses the Use and Occupancy Classifications specified in Part 2 Chapter 3; all R-2 buildings are multifamily buildings. This provisions allows multifamily buildings with four or more dwelling units to have the option of complying with either residential or nonresidential outdoor lighting requirements. Staff notes that the change proposed to this Section is nonsubstantive and clarifying in nature; staff has not received a specific request to extend this option to three-dwelling multifamily buildings, though could consider doing so.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222688	2/23/2018
222691	Robert Raymer (CBIA)	CBIA agrees with the Statewide CASE team recommendation that the 45-Day Language be modified to eliminate the filter pressure drop and size requirements (as described in their comments submitted to the Docket on February 21, 2018.)	Staff provided additional research information to CBIA helping to address their concerns, and added an option for a properly sized one-inch depth as an alternative to a two-inch depth; CBIA has thus determined to support the Energy Commission's proposals for air filter sizing. Ref: Staff Analysis of Air Filter Pressure Drop and Air Filter Sizing (April 2018) https://efiling.energy.ca.gov/getdocument.aspx?tn=223260	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222691	2/23/2018
222691	Robert Raymer (CBIA)	CBIA remains concerned that the Investor Owned Utilities (IOU) have expressed concern over the CEC proposal to allow compliance credit for oversized PV systems when they are coupled with a battery. CBIA supports this credit as it allows builders design flexibility in the move towards full Zero Net Energy construction practices. Both the 2019 Standards and 2019 CALGreen propose metrics to allow PV oversizing, but CEC staff has yet to address the fundamental oversizing issue presented by IOU representatives. CBIA looks forward to working with the CEC, IOU's and the PUC to address these issues in the near future.	Staff appreciates the comment of support; staff worked with IOU stakeholders and others to refine the PV sizing requirements, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222691	2/23/2018
222691	Robert Raymer (CBIA)	CBIA strongly supports the Grid Harmonization Credit (GHC) which will allow a portion of the total battery compliance credit to be used toward the energy efficiency energy design rating (EDR)	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222691	2/23/2018

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222691	Robert Raymer (CBIA)	Per Gary Klein's suggestion, CBIA would like to recommend that IGC 346-2017 can be used to rate the efficiency at any slope from horizontal to vertical. As worded, the paragraph states that vertical units must be tested and labelled in accordance with the CSA standards. However, the efficiency could also be tested in accordance with the IAPMO Guide Criteria (IGC). CBIA recommends the following change to section (a): A HERS inspection is required to obtain this credit. All DWHR unit(s) shall be certified to the Energy Commission according to the following requirements: (a) Vertical DWHR unit(s) shall be compliant with CSA B55.2, and tested and labeled in accordance with CSA B55.1 or IAPMO IGC 346-2017. Sloped DWHR unit(s) shall be compliant with IAPMO PS 92, and tested and labeled with IAPMO IGC 346-2017. (b) The DWHR unit(s) shall have a minimum rated effectiveness of 42 percent.	Staff has added reference to this procedure to Sections RA3.6.9 and RA4.4.21, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222691	2/23/2018
222691	Robert Raymer (CBIA)	The language in Section 150.0(o)1C is unnecessarily technical for inclusion in the text of the Standards. The following language should be moved to the ACM Reference Manual: The infiltration credit shall be calculated according to ASHRAE 62.2 Section 4.1.2.1 using a value for leakage rate in cubic feet per minute at 50 Pa (0.2 inch water) (Q50) based on the conditioned volume of the dwelling unit and a default value for dwelling unit envelope leakage of 2 air changes per hour at 50 PA (0.2 inch water) (2 ACH50) as described in the equation 150.0-A below. Q50 = [(dwelling unit conditioned volume in ft3) x (2 ACH50)] / (60 min) (Equation 150.0-A)	Staff finds that stating the equation in Part 6 is necessary in order to legally require its use: the ACM Reference Manual exists to ensure transparency regarding how the CBECC software models building energy efficiency and verifies compliance with mandatory requirements, and is not an appropriate vehicle for specifying regulatory requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222691	2/23/2018
222691	Robert Raymer (CBIA)	1. CBIA comments the excepted areas of Section 130.1(a) should include all areas for which proper lighting is important for safety purposes. 2. CBIA recommends that CEC staff consult the appropriate health and safety code sections and with the Office of the State Fire Marshal and the Building Standards Commission to ensure that the proposed exception does not conflict with other parts of the building code and that the Standards do not inadvertently encourage unsafe practices.	1. Staff has added the phrase "other areas where placement of a manual area control poses a health and safety hazard" to the noted Exception, consistent with the commenter's suggestion. 2. Staff has sought and received feedback from State Fire Marshal and from CBSC; staff notes that the Exception to Section 130.1(a) for egress lighting was amended specifically to ensure harmonization with Part 2, consistent with the commenter's suggestion.		2/23/2018
222691	Robert Raymer (CBIA)	1. CBIA comments the excepted areas of Section 130.1(a) should include all areas for which proper lighting is important for safety purposes. 2. CBIA recommends that CEC staff consult the appropriate health and safety code sections and with the Office of the State Fire Marshal and the Building Standards Commission to ensure that the proposed exception does not conflict with other parts of the building code and that the Standards do not inadvertently encourage unsafe practices. The Exception to Section 130.1(a)1	1. Staff has added the phrase "other areas where placement of a manual area control poses a health and safety hazard" to the noted Exception, consistent with the commenter's suggestion. 2. Staff has sought and received feedback from State Fire Marshal and from CBSC; staff notes that the Exception to Section 130.1(a) for egress lighting was amended specifically to ensure harmonization with Part 2, consistent with the commenter's suggestion.		2/23/2018
222703	William Spencer Olinek (PG&E)	In addition to seeking clarification on the second criteria, PG&E suggests a clarification and edit to the third criteria. The wording should be modified to clarify that the energy savings benefits can be in the form of dedicated or assigned renewable energy, and will not require bill reductions. (see page 4 for suggested language)	Staff has added "payments to the building that will have an equivalent effect as energy bill reductions" so that options other than bill reductions are available, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

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222703	William Spencer Olinek (PG&E)	Pacific Gas and Electric (PG&E) appreciates the care that the California Energy Commission (CEC) has taken to design an alternative pathway for compliance with the residential solar requirements in the 2019 Title 24 standards that will be available if installing solar on the building site is not a viable option. Overall, the six criteria for the desired program are reasonable and we believe it could be possible to design a program that meets our current interpretation of these criteria.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018
222703	William Spencer Olinek (PG&E)	PG&E proposes revisions to the language surrounding the CEC's approval process. As mentioned above, efficiencies could be gained by streamlining approval for applications that are based on a CECapproved programs or tariffs. (see page 4 for suggested language)	Staff finds that the language in Part 1 Section 10-115 already allows for a community solar project approval to be extended to additional projects meeting the criteria of the approved plan to proceed without the need to obtain additional re-approval. Staff does not find that the PG&E suggested edits are necessary, nor that its open-ended phrasing would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018
222703	William Spencer Olinek (PG&E)	PG&E requests that if an appropriate program or tariff were designed in consultation with the CEC, and approved as necessary by the CPUC, that CEC would consider approving an application to use the Green Tariff Shared Renewables (GTSR) program or tariff to comply with the community solar requirements. Relying on a revised GTSR program's review process to confirm the design and performance of community solar projects could help streamline the Title 24 compliance and enforcement process, thereby alleviating some burden from CEC and other jurisdictional authorities. (see page 4 for suggested language)	Staff finds that CPUC approved green tariffs that comply with the provisions of 10-115 may be approved as a community solar program under 10-115. Staff does not find that waiving 10-115 requirements based solely on CPUC approval would be appropriate, as it would not provide the necessary assurance that PRC 25402 is met.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018
222703	William Spencer Olinek (PG&E)	PG&E suggests edits to criteria five. There is definitional contradiction of "community shared solar" or "community shared battery storage system" and claiming that the community systems serve one building "exclusively." By definition, a shared system will serve more than one beneficiary. Deleting the word "exclusively" from the code language will serve to clarify this section's purpose. (see page 4 for suggested language)	Staff notes that the singular phrasing includes the plural: the benefits must be provided to the dedicated buildings (noting also that the benefit to any specific dedicated building must none the less comply with 10-115(a)3). Staff does not find that permitting the benefits of the dedicated system (or the dedicated portion of the system) to be redirected to other purposes would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018
222703	William Spencer Olinek (PG&E)	Regarding the code language in Title 24, Part 1 Section 10-115, PG&E seeks confirmation that the second criteria, Energy Performance, should be interpreted as follows: the electricity (kWh) delivered or assigned to the home are renewable, as would be the generation from a rooftop installation, and that the greenhouse gas (GHG) emissions are zero for all energy delivered or assigned to the home.	Staff has revised and clarified the language in Part 1 Section 10-115; in context, staff finds that the PG&E suggested interpretation in the comment letter may be overly broad, and therefore staff is not able to confirm its accuracy relative to the revised Express Terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222703	2/23/2018
222718	Richard Rollins	The CEC should update the code to facilitate a shift off natural gas to high efficiency, all-electric climate friendly buildings. The CEC should use a GHG metric for code compliance, not the TDV energy cost metric which is biased in favor of gas/"mixed-fuel buildings."	Staff has proposed changes in several Sections that facilitate all-electric construction, consistent with the commenter's suggestion. Staff finds that using a greenhouse gas metric that does not determine the amount paid by consumers of energy would require a change in statute; while greenhouse gas emissions can be considered in addition to cost effectiveness, current statute does not allow for adoption of a measure that is not cost effective to the consumer. Thus, staff does not find that consideration of greenhouse gas emissions alone would allow for adoption of a regulation without considering direct (i.e., energy bill) costs and savings, and that use of TDV remains appropriate for calculating the effect that use patterns will have on future energy rates and bills. (Staff additionally notes that TDV is not "biased"; the current cost of natural gas is low, as are costs for carbon emissions. TDV is accurate in estimating consumer costs, noting that increasing either cost shifts which fuel source represents a greater monetary cost to the consumer.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222718	2/24/2018

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222721	Steve Birdlebough	Adopting standards that place high priorities on solar heating and power, thermal and battery storage of heat and power, and an efficient building envelope, will serve people best in the long-run. Please do not discount the full social costs and risks extending gas infrastructure nor the greenhouse gas impacts of methane leakage, in establishing standards. Also, consider the air quality, health, reliability, and stranded asset risks of gas appliances. Cities and counties should be encouraged to cease expansion of gas service.	Staff has considered concerns identical to those noted by the commenter as a part of the overall process of drafting and proposing amendments to regulation, and that the proposed measures relating to solar photovoltaic systems and battery storage systems are consistent with the commenter's suggestion. Staff finds that natural gas infrastructure costs are appropriate to consider when they would be compelled by proposed regulations; staff notes that the Express Terms proposes to *remove* provisions that compelled inclusion of natural gas infrastructure, in part to more readily permit the construction of all-electric buildings. Staff notes that the Energy Commission does encourage local jurisdictions to adopt above-code ordinances, which may include ordinances relating to electrification.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222721	2/25/2018
222733	Astar Harmon (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222733	2/26/2018
222734	Bruce Severance	Advanced Framing benefits are generally underestimated. Conductive heat loss and reduced cost of full advanced framing make it worthy of becoming a mandatory measure on single and two story structures.	Staff finds that imposing a new mandatory framing requirement has the potential to increase costs; staff therefore finds that a cost analysis would be necessary to consider this proposal. Staff therefore invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	All projects should require a broader range of air sealing measures to prevent vapor drive into wall assemblies (potential mold) and to increase efficiency in a manner that is far more cost effective than most other measures. (suggested air sealing checklist on page 12)	Staff finds that imposing new mandatory air sealing requirements has the potential to increase costs; staff therefore finds that a cost analysis would be necessary to consider this proposal. Staff therefore invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Combustion Appliance Safety: All gas fireplaces should be sealed combustion type with dedicated combustion air intakes or direct vents and a minimum AFUE of .90.	Staff finds that additional design requirements for gas fireplaces are likely to impose additional costs; staff therefore finds that a complete code change proposal including a cost analysis would be required in order for this proposal to be considered. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Combustion Appliance Safety: I think it is important to allow electric fireplaces in all-electric ZNE homes that have high efficiency heat pumps or mini-splits, provided that there is a sign on the side of the electric fireplace reading that it is not to be used for primary heat, but primarily for “decorative purposes only”. Alternatively, the state should encourage electric fireplace manufacturers to either build in 30-minute timers that turn the heat off but leave the flame on, or include a feature that would allow the installer to flip a switch that is not normally accessible to the occupant that turns the heating function of the fireplace off but leaves the decorative flame on. I feel this is actually important to satisfy the need for decorative fire effects in non-combustion appliances.	Staff does not find that either the current regulations nor the proposed Express Terms limit the installation of purely aesthetic or decorative electric appliances; conversely, products that provide room or space heating must meet associated requirements regardless of appearance, and staff does not find it appropriate to waive these requirements based on appearance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Combustion Appliance Safety: If gas appliances are to be allowed, they should at very least be the highest efficiency sealed combustion types (95% to 98% efficiency).	Staff finds that most gas appliances are subject to federal appliance efficiency regulations that preempt the establishing of more aggressive State standards; in addition, a cost analysis showing the costs and benefits of moving from current requirements to the proposed requirements would be required to consider this change. Staff therefore invites the commenter to submit a complete code change proposal that includes all required information and analysis, including consideration of federal preemption, for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	Combustion Appliance Safety: The 2016 Compliance Manual mentions avoiding “backdrafting” but does not explicitly address the most common scenarios: 1) naturally drafted water heaters in laundry rooms where the 150cfm dryer can easily backdraft the DHW when the door is closed. The example calculation for this includes the area of the entire house rather than the area of the laundry room (when the door is closed). This seems like a considerable oversight. This is the most typical backdrafting scenario which as a BPI GC I have found in countless older homes and should be clearly spelled out in the code.	Staff finds that this is a comment on the Compliance Manual and neither a comment on a proposed amendment in the Express Terms nor a proposal to amend the Express Terms. Staff has forwarded the comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Combustion Appliance Safety: Wood stoves should be prohibited state wide.	Staff notes that the Energy Commission's authority to adopt regulations is based on energy, not safety; while the Energy Commission does consider health and safety in deciding what measures to propose and adopt, a prohibition on wood stoves based solely on safety concerns (and unrelated to energy efficiency or conservation) would not be placed in Part 6 nor would it be adopted under Energy Commission authority to promulgate energy efficiency standards in Part 6. Staff would direct the commenter to work with the California Building Standards Commission and the California Department of Housing and Community Development in proposing this prohibition for inclusion in the California Building Standards Code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Compact design should be mandatory in new construction.	Staff finds that mandating compact design would drastically limit architectual flexibility without providing clear benefit compared to a prescriptive requirement and associated performance baseline. Staff therefore does not find that limiting building design in this way would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Compact plumbing design can cut rough plumbing costs in half. It eliminates the need for recirc systems of any kind and can cut line losses and as a result standing losses. Because the cost is lower, and it can reduce 20% or more of the energy used in a home depending on climate zone, it should be a mandatory measure.	Staff finds that requiring compact distribution as a mandatory measure, rather than a prescriptive option or part of the performance baseline, restricts architectural design without providing a unique benefit (i.e., a benefit that is not also achievable via other improvements to the building). As other efficiency measures can provide the same overall benefit to energy use, and given that the acievability of compact design is highly dependent on floor plan, staff does not find that mandating system design in this way would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Energy code should include discussion of minimum building standards for attachment of exterior foam especially as it pertains to vapor drive and suspended siding loads.	Staff finds that a minimum building standard relating to exterior foam would be likely to impose new or additional costs, and that a cost analysis would be required in order to consider adoption of such a standard. Staff therefore invites the commenter to submit a complete code change proposal inclusive of all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Fenestration – Section 110.6 a&b: Air leakage at doors and windows that are not properly sealed can be significant due to differential pressures around various sides of a structure in high wind conditions. Such air leakage has the potential of completely negating the effectiveness of other very costly measures such as high performance attics and exterior foam insulation. At very least, if field fabricated doors and windows are allowed, blower door testing by a HERS rater should be required to verify whole house leakage rates below 2.0 ACH at 50pa depressurization or a similar stringent standard.	Staff finds that existing Part 6 language already addresses the circumstances identified by the commenter, including both manufacturer and on-site leakage testing. To the extent that the commenter is suggesting new requirements or increased stringency compared to current requirements, staff finds that such changes have a potential to increase costs and therefore that a cost analysis would be needed for the Energy Commission to consider the proposal. In this case, staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Fenestration – Section 110.6 a&b: All doors and windows should be weather stripped and caulked especially fire doors through demising walls that separate garages or shops from conditioned space. The code currently allows open combustion appliances to be located in garages, as well as continuously operating exhaust fans supposedly to meet IAQ and ASHRAE 62.2 standards. This combination of circumstances could depressurize the conditioned space leading to backdrafting and CO infiltration. Clearly, fire doors must be sealed.	Staff finds that imposing new requirements for additional weatherization have a potential to increase costs and therefore that a cost analysis would be needed for the Energy Commission to consider the proposal. Staff therefore invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding; staff additionally notes that any requirements applicable to fire doors must be developed in consultation with the State Fire Marshall.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Full slab insulation and some passive design considerations should be mandatory measures because they are so cost effective.	Staff finds that a new mandatory requirement relating to slab insulation would be likely to impose new or additional costs, and that a cost analysis would be required in order to consider adoption of such a standard. Staff therefore invites the commenter to submit a complete code change proposal inclusive of all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222734	Bruce Severance	Gary Klein's research for the CEC on water and energy savings with reduced pipe sizes (1/2" trunks and 3/8" branches) seems particularly relevant as it costs less, greatly reduces pipe surface area and heat loss, and reduces wait times further. These should be mandatory measures.	Staff finds that reduced pipe sizes are unlikely to work for all buildings and are likely to conflict with plumbing code requirements; without additional information, staff does not find it to be appropriate to mandate smaller pipe sizes as suggested by the commenter. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking that includes a consideration of multiple building types and scenarios, as well as plumbing code requirements and their justifications.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Heat Pump Hot Water Heaters: Condenser-integrated HP DHW units need to be located in garages or other attached unconditioned spaces. Because they extract BTUs from the air in the garage and dump that heat into the tank's water, they can make garages quite cold, leading to potential heat loss and condensation on demising walls that are not usually as well insulated as exterior walls.	Staff finds that heat pump water heaters are used in colder climates than California (such as Washingon and Minnesota) without issues, and that options exist under both the prescriptive and performance compliance approaches to use natural gas for water heating. Staff notes that the walls between conditioned dwelling space and unconditioned garage space are required to be insulated to the same level as exterior walls, and does not find evidence that use of heat pump water heaters are likely to cause condensation on walls.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Heat Pump Hot Water Heaters: HP DHW systems that have separate outdoor condensers are about twice the cost ($3600) but do not make garages cold and offer the design flexibility to position the tank in the middle of main baths for immediate hot water to showers and to facilitate compact plumbing design. When powered by on-site solar or wind, these systems are far less expensive and problematic than solar thermal systems which are known to cost $8k to $20k and have far more maintenance and failure mode issues.	Staff finds that the comment neither relates to proposed amendments to the Express Terms nor proposes an amendment to the Express Terms; staff notes that "split system" heat pump water heaters are already able to be modeled within the CBECC software and able to be installed under the performance approach to compliance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Heat Pump Hot Water Heaters: There should be a prescriptive option for HP DHW units given the push toward ZNE.	Staff notes that multiple prescriptive options for heat pump water heaters are proposed for the Express Terms, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Heat Pump Hot Water Heaters: There should be a requirement for HP DHW ready, requiring a 240V dedicated circuit for a future HP unit as well as a condensate drain path.	Staff notes that the Express Terms include a requirement for a dedicated socket consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Heat Pump Hot Water Heaters: These systems are usually 2 to 3 times more efficient than resistance electric water heaters and have the ability to match TDV of gas-fired water heaters. However, they are loud and many home owners do not like their garages to drop to 40 degrees. Also, most architects don't like putting the main showers next to the garage for compact plumbing design.	Staff finds that heat pump water heaters are used in colder climates than California (such as Washingon and Minnesota) without issues. Staff does not find that allowing electric resistance water heating would be appropriate, as options exist under both the prescriptive and performance compliance approaches to mitigate the effects noted by the commenter without multiplying water heater energy use.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	High Performance Attics – Vented: Deck insulation seems most necessary if unvented attics and cathedral ceilings are preferred. They are also necessary under habitable roof decks over living space where vapor drive and cold temperatures can cause condensation in ceiling assemblies.	Staff finds that builders can use these approaches under the performance approach to compliance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	High Performance Attics – Vented: If the goal is to reduce the delta-T from attics to ducts, it would be more cost effective to significantly increase ceiling insulation from R-38 to R-60 in climate zones 4 and 8-16 and require that all ducts be deeply buried. The heat loss equation doesn't lie. If deeply burying ducts makes the effective R-value R-25, then the heat loss equation dictates that R-60 attic insulation over deeply buried ducts with a total surface area of 1400sf in a 140 degree F. attic has about the third of the duct losses as the same size ducts that are R-6 in a 110 degree attic: Q=U.04*1400*Delta-T80=4480BTU versus: Q=U.166*1400*Delta-T 50=11,666.	Staff finds that the performance compliance approach already provides an avenue for builders to do what the commentor is describing. If the commenter is intending to propose that the regulations include this as a mandatory or prescriptive requirement, a cost analysis describing the costs and benefits of this measure would be required; staff in this case would encourage the commenter to submit a complete code change proposal including all needed analysis and data for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222734	Bruce Severance	High Performance Attics – Vented: The CBECC model seems to be biased toward HPAs in all climate zones. Much higher credit is given to HPA options over deeper ceiling insulation with deeply buried ducts when the heat load equation seems to indicate otherwise. Requiring deck insulation in vented HPAs in climate zone 16 as well in as in other climates that see an equal amount of extreme cold and hot conditions, seems to mitigate only extreme summer heat gains and does nothing for winter heat losses. It seems less cost effective than other options, such as eliminating ducts completely, given year round conditions.	Staff finds that the comment neither relates to proposed amendments to regulation nor suggests an amendment to regulation; staff notes that the comment is in relation to the CBECC modeling software. Staff does not find that this software inaccurately models the impacts of deck insulation, and the commenter does not articulate the "bias" in the software other than noting that adding deck insulation often outperforms deepening ceiling insulation (which appears to be accurate). If the commenter has data that can be used to improve the accuracy of performance modeling, staff invites the commenter to submit that data to the software team.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	High Performance Attics – Vented: The CBECC model seems to be biased toward HPAs in all climate zones. Much higher credit is given to HPA options over deeper ceiling insulation with deeply buried ducts when the heat load equation seems to indicate otherwise. Requiring deck insulation in in vented HPAs in climate zone 16 as well in as in other climates that see an equal amount of extreme cold and hot conditions, seems to mitigate only extreme summer heat gains and does nothing for winter heat losses. It seems less cost effective than other options, such as eliminating ducts completely, given year round conditions.	Staff notes that the comment is in relation to the CBECC modeling software and does not relate to the Express Terms; Staff finds that the CBECC modeling software is accurate in modeling the anticipated energy impacts of various attic designs, including varying levels of ceiling and roof insulation. The commenter's concern has none the less been passed on to our software team.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	High Performance Attics – Vented: The code requires above or below deck insulation in climate zone 16 which is alpine and has predominantly heating loads. This seems illogical. Winter heat losses are probably equal to or greater than summer heat gain in this climate zone. Deeply burying ducts in 24" of R-60 insulation would be less expensive and mitigate against year round losses in climate zones that experience both hot and cold extremes.	Staff notes that roof deck insulation is not required: the Express Terms provide two prescriptive options, one using below-roof-deck insulation and one using a radiant barrier (in addition to an amount of ceiling insulation), and the performance compliance path would allow for the approach suggested by the commenter. Staff therefore does not find that any change to the Express Terms is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	High Performance Attics – Vented: The cost of additional blown insulation at the ceiling plane (R-60 instead of R-38) is about 45 cents per square foot, far less even with heel trusses than the cost of roof deck insulation (about $1.00/sf of floor area). Furthermore, lower attic temperatures can be achieved with $200 solar attic fans to lower attic temperatures without deck insulation.	Staff notes that the performance compliance path allows for use of methods and devices beyond what is specified for the prescriptive options, including the methods suggested by the commenter. Staff therefore does not find that any change to the Express Terms is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: In-slab hydronic heating eliminated temperature modulation that an insulated slab provides in passive solar design. In other words, they cost about $28k to $40k ($15-$20/sf) and prevent much more affordable passive heating scenarios from working ($2.50/sf).	To the extent that the commenter is intending to propose a new standard related to in-floor hydronic heating, staff finds that the comment is not specific enough to draft or consider a specific standard. Staff therefore invites the commenter to submit a complete code change proposal inclusive of all necessary detail and analysis for the 2022 rulemaking proceeding. Staff otherwise finds that the comment neither relates to a proposed amendment in the Express Terms nor proposes to amend the Express Terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: In-slab hydronic systems should be discouraged precisely because they aren't cost effective, they prevent cheaper passive features from working properly and they create a high Delta-T at the slab even if there is R-10 insulation under the entire slab.	Staff finds that the comment neither relates to proposed amendments to regulation nor suggests an amendment to regulation; staff is unclear in what way regulations should additionally discourage systems that are not cost effective. (Staff notes that the purpose of Part 6 is to require the minimum level of energy efficiency that is found to be cost effective, and not to otherwise limit building design: builders are free to implement additional or alternative non-cost-effective features should they so choose.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: IT MAKES NO SENSE THAT THE 2016 CODE GIVES A COMPLIANCE CREDIT TO HYDRONIC HEATING SYSTEMS DUE TO ELIMINATION OF DUCTS WHEN THE HYDRONIC LOSSES ARE IN FACT MUCH WORSE THAN DUCT LOSSES IN A VENTED HIGH PERFORMANCE ATTIC WHEN SHORT DUCT DESIGN IS EMPLOYED.	Staff notes that the comment relates to the performance modeling of hydronic heating systems in the CBECC modeling software and not to provisions in code. Staff does not find that the modeling of the performance of ductless HVAC systems is inaccurate, noting that the calculated impacts of removing ducts is not specific to hydronic systems and also applies to ductless heat pump systems. If the modeling software is calculating smaller "hydronic losses" than have been observed by the commenter, staff invites the commenter to submit the associated observational data to our software development staff so that the model can be improved.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	In-Floor Hydronic Heating: Not only do the preclude passive solar from working, in-slab radiant grids dump operating at water temperatures of 140 F. dump 70 BTUh to 80 BTUh to ground per square foot when there is no slab insulation (climate zones 1-15) for at least the few hours of system operation.	Staff finds that the comment neither relates to proposed amendments to the Express Terms nor proposes an amendment to the Express Terms; staff notes that the requirements in Part 6 are intended to be technology neutral whereever possible.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: Radiant wall panels are much more cost effective (saves $20k compared to in-floor), but must be sized properly relative to water temperature (Delta-T) to achieve sufficient heat transfer. Wall mounted radiant panels and baseboard heaters are only mentioned in passing in the 2016 compliance manual and none of the critical design variables are mentioned.	Staff notes that this comment appears to be in relation to the Compliance Manuals and not to regulatory language; the Compliance Manuals will be updated following adoption of proposed changes to Part 6, and will be subject to their own public comment period. Staff invites the commenter to participate in this process and to suggest complete, informative language relating to the use of this technology.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: The introduction of the SanCo2 heat pump water heater with a separate outdoor unit makes it possible to design relatively affordable combination systems that integrate domestic hot water with hydronic heating with high COP of 4 to 5.5 and that operate without strip heat with outdoor temperatures as low as -15F. The average home could be heated with the power of four solar panels in most climate zones. However the BTU output of these systems would require extremely low-load shell design. The code makes no mention of this technology.	Staff has not received any proposals or data about this equipment; staff additionally notes that not every possible building product, method or technique is expressly mentioned in the minimum efficiency standards in Part 6. If the commenter is proposing to include an express standard or requirement relating to this technology in Part 6, the commenter would need to explain the intended application of the device, its costs and benefits, and the other items noted in the code change proposal template provided to the public such that the Energy Commission a well as the public can conduct a complete consideration of the likely effects of adopting regulatory language. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	In-Floor Hydronic Heating: Why is so little slab insulation required for hydronic in-floor systems when the first three hour losses are so high and it is relatively inexpensive to install it?	Staff finds that increasing insulation requirements is likely to increase costs, and that a cost analysis would be needed in order to consider this measure. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	It is clear to me that it is far more cost-effective to use thinner exterior foam systems such as Kingspans DC14 which is an exterior foam with an integrated rain screen that staples on and is far more cost-effective if used with higher Rvalue blown wall insulation such as Optima that yields a wall cavity R-value of R-23 (in 6" stud assembly, with minimal air gaps and more predictable install quality). I have a cost versus performance 10-page spread sheet for various wall assembly designs that I am happy to provide.	Staff notes that the HPW requirement is based on a U-factor, and therefore can be met using various combinations of insulation (cavity vs. continuous); the requirement is intentional in specifying a target performance and allowing flexibility with regards to the specific assemblies used to meet the target. Staff does not find that prescribing a specific assembly, even if cost effective, would be appropriate as it would unnecessarily limit both market competition and design flexibility.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Localized blown urethane foam should be required around steel hold-downs to assure insulation around these highly conductive elements that are likely to create air gaps and thermal bridging around them if they are not sprayed with foam.	Staff finds that adding a requirement for additional insulation would include a commensurate increase in cost, meaning that commenter's proposal would require a complete cost analysis before the Energy Commission could consider it. Staff therefore invites the commenter to submit a complete Code Change Proposal on this topic for the 2022 Rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Minimum Solar Area – Section 110.10b: It is insufficient to allow a dedicated solar area that is incapable of meeting net zero requirements for single family and low-rise multi-family structures. The 250 s.f. minimum allowance allows 14 standard PV panels (assuming precise proportions) which would have a 4 kW output under the best scenarios. This is enough to provide plug loads and lighting in most homes but does not handle hot water and HVAC demands let alone future EV charging.	Staff notes that the specification in Section 110.10(b) is a *minimum* specification, consistent with the overall purpose of Part 6 in setting minimum standards; staff finds that the purpose of the minimum solar zone requirement is to ensure sufficient reserved space for a cost effective solar array, noting that the size of the space is generally sufficient for a minimally sized PV array consistent with Section 150.1(c)14. Staff finds that requiring reservation of a sufficiently large area to account for all possible electric loads would greatly and unnecessarily restrict building design, and would exceed what has been found to be feasible and cost effective to require in newly constructed buildings. Staff therefore does not find that making the suggested change would be appropriate. (To the extent that the commenter is intending to propose a specific, larger square foot area for the minimum solar zone, staff invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Minimum Solar Area – Section 110.10b: It is not at all difficult to design homes that can accommodate two to four times that solar area. To reduce the minimum to 150s.f. for a three-story 2000s.f. home is an extremely low bar and is not in line with the real goal of achieving ZNE design in this code cycle. Combining plumbing vents should be suggested or encouraged by the code as a practical solution.	Staff finds that increasing the design specifications noted by the commenter would likely to incur additional costs, and therefore that a cost analysis would be required in order for the Energy Commission to consider the proposal. Staff therefore invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	Minimum Solar Area – Section 110.10b: Orientation is so important to solar output as well as to the feasibility of passive solar design that the code needs to make it explicit to developers and planners that whole communities. Suggesting that it is appropriate to orient solar panels within 110 and 270 degrees is a significant compromise in a retrofit situation. If we have a greenfield opportunity with new construction, we should be recommending due south orientation and restricting orientation to within 20 degrees of due south (160-200) to keep the high cost of solar cost-effective in its actual output.	Staff notes that the solar ready zone would only apply where solar PV systems are not included in the building project. Staff finds that a more narrow degree range would only act to reduce the size of the potential solar area, and create smaller solar ready zones and more exceptions to solar ready requirements, noting that a solar ready zone is only required where the potential solar area supports it.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Minimum Solar Area – Section 110.10b: streets and lot proportions in ZNE communities need to be laid out to maximize the cost-benefit equation of imposing ZNE standards. If we don't actually emphasize the variables that are important to making ZNE design work in a manner that is cost effective, it will be a matter of time before the National Association of Home Builders will beat back these regulations and take us back to the conventional status quo. The importance of designing ZNE communities, orienting streets, making lots have longer frontages on streets with east-west orientation to accommodate passive solar design, and placement of shade trees and shrubs where they will not impact solar access should be repeated in several places in the code to be sure both planners and developers are maximizing the cost effective methods of getting to ZNE.	Staff finds that specifying street design and lot arrangement is outside of the current scope of Part 6 and may exceed the scope of the Title 24 Building Standards Code generally. Staff therefore does not find that Part 6 would be an appropriate vehicle for State-level restrictions on the authority of local planning departments as it relates to the approval of parcel and subdivision maps.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Minimum Solar Area – Section 110.10b: The typical three-bedroom home is going to need a 10kW solar array to offset all energy used onsite at a minimum. This will require 640 s.f. , preferably facing south and all in one block uninterrupted by roof jacks to save cost and improve appearance.	Staff finds that a 2019-compliant 2700 square foot home requires (on a statewide average) a 3 kW system to fully offset its calculated electricity consumption. Staff therefore does not find the commenter's conclusion of necessary roof space to be accurate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Pipe insulation is far less expensive to do if compact plumbing and reduced pipe diameters eliminates 50% of the pipe surface area. This should also be a mandatory measure. Let's embrace the cost effective strategies.	Staff finds that imposing pipe diameter requirements is potentially disruptive to plumbing design and may have unforeseen costs and impacts. For this reason, staff does not find it appropriate to establish pipe diameter standards in response to public commentary; staff invites the commenter to submit a complete code change proposal that includes specific sizing requirements and a complete consideration of costs and benefits for the upcoming 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Radiant Barriers: The 2016 Compliance Manual explains that below deck radiant is not needed if there is below deck insulation because the barriers don't work without an adjacent air gap. The problem is that the Oak Ridge Lab research on this indicates that the reflective surface of the radiant barrier must face up with a gap above it to mitigate unwanted heat gain. The photos of the radiant barrier at the roof deck show the shiny side pointing down with the air space below as a method to mitigate unwanted heat gain, contrary to Oak Ridge National Lab research.	Staff notes that the comment does not relate to the proposed amendments to regulation, as it reegards instead the Energy Commission's compliance software. None the less, staff finds that the commenter is confusing reflectance, emittance and absorbance. Radiant barriers provide differing benefits based on which direction they are facing (towards the interior vs. towards the exterior), and staff finds that the software accurately models the impacts of radiant barrier products.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Radiant Barriers: The intent that is described in the text of the CEC code is contrary to how the radiant barriers are pictured. For best results, the radiant barrier should be integrated into the waterproofing membrane underneath concrete tiles so that the reflective surface faces upward into the airgap below the tile. Radiant Barriers: Below deck membranes should face upward into an airgap below the roof deck to be effective. Oak Ridge tested this and developed a product that achieves this configuration but it was never commercialized (at last notice). Their tests showed the best effect when this below deck gap was vented at the eave and at the ridge or peak of the roof.	Staff finds that the example noted by the commenter is consistent with the modeling results of the Energy Commission's software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	Radiant Barriers: The radiant barrier facing downward may make sense in heating load climates as it should help retain heat in the attic, but I have heard that the effect is minimal. Has the CEC tested identical homes with and without radiant barriers, and with barriers facing up into an airgap above as Oak Ridge has? If so, can you send me a copy of that research paper?	Staff is not proposing changes to radiant barrier requirements within the current rulemaking. As such, the record for this proceeding does not contain that information. Staff invites the commenter to review the rulemaking records of the prior proceedings under which the requirements were adopted, as these identify the documents relied upon for the current language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Rainwater Catchment -Section 110.10: 2) There are tall and narrow tanks that are designed to fit under the eaves of a house (2' x 6' x 6') that hold approximately 500 gallons and cost less than $800 each. The option should include one or two of those "for gardening purposes only". Below grade cisterns are extremely cost prohibitive and expensive to maintain because the fill with leaves and silt which causes pumps to fail. Options such as this need to be practical. Underground cisterns should be avoided as they will not be maintained and will cost a great deal more that above ground storage.	Staff notes that the language of 110.10 does not specify any particular design for the "rainwater catchment system"; staff finds that the described design is fully allowed. Staff does not find that prescribing only a single type or design of cistern would be appropriate given that an equivalent benefit of capturing available rainwater (and offsetting use of potable water) is provided in both cases.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Rainwater Catchment -Section 110.10: An averaged sized home (1600s.f.) will have about 2000s.f. of roof area. In an area with moderate rainfall (19 inches per year) will generate over 23,000 gallons a year. If we are to catch "at least" 65% of that, we need a rain catchment that can hold 15,400 gallons of water and which would occupy over 2000 cubic feet requiring for example, a tank 12' diameter tank over 20' tall with a cost of $9800. Given that the code does not suggest that this water be used for anything but gardening it is an impractical suggestion for most tract homes and will be eliminated from nearly all projects.	Staff notes that captured water may be useful for any graywater purpose; watering of gardens and lawns is the most universally applicable (but by no means only) use, and the regulations in no way restrict the use of captured water. The requirement also does not (and is not intended to) require that 65% of all rainwater be captured, but more simply requires that a sufficient percentage of roof area is directed toward a catchment so that a useful quantity of water can be reliably captured during rain events (including brief rain events). Staff additionally notes that most rain is intermittent - in most cases there will be an opportunity to use water collected from one rain event prior to the next rain event, thus available storage of only a fraction of annual rainfall can still serve to capture and repurpose most or all of the received rainwater. Staff therefore does not find any change to this provision to be necessary or appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Section 120.1 IAQ & ASHRAE 62.2: Although it makes sense to give the infiltration credit of 2ACH50, given the tighter building envelopes we are building today, it does not make sense to meet ASHRAE 62.2 with anything but a dedicated, balanced fresh air ventilation fan with a heat exchanger. Infiltration is not ventilation, and infiltration from walls, crawlspaces and attics is not likely to produce fresh air.	Staff finds that appropriate design can enable effective ventilation using other strategies; staff notes that the purpose of the required sealing and testing when non-balanced approaches are used is to ensure that the strategy results in exchange of outside air and not exchange of air between indoor spaces. Staff therefore does not find that a requirement for exclusively balanced ventilation systems would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Section 120.1 IAQ & ASHRAE 62.2: Bath exhaust fans should be controlled by timers with humidistats so they turn themselves on when humidity in the room builds up to control moisture, and potential mold and vapor drive at the source. Humidistats should be a mandatory measure.	Staff finds that adding humidistats is likely to increase cost, therefore a cost analysis showing the costs and benefits of requiring this equipment would be necessary before it could be considered. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Section 120.1 IAQ & ASHRAE 62.2: Page 4-69 in the 2016 Compliance manual offers example 4-14 which appears to state that a bathroom exhaust fan that doubles as an ASHRAE 62.2 IAQ fan is required to have a label on the switch to inform the occupant that the fan should be running whenever the home is occupied. If that is true, then all any house requires to meet 62.2 is a label on the bathroom fan. I believe this to be a misinterpretation of Section 4.4 of 62.2 quoted on page 4-68 of the Res Compliance Manual which states that a "fan-on switch of a conditioning system must be appropriately labeled". This section applies specifically to CFI -IAQ systems, which are so inefficient they should be prohibited. Fans providing fresh air should run continuously or intermittently and not be shut off as normal exhaust fans.	Staff finds that ASHRAE 62.2 requires building occupants to have a readily accessible manual on-off control, including but not limited to a fan switch or a dedicated branch-circuit overcurrent device. The controls are required in order to provide the building occupant the ability to turn off the ventilation fan if outdoor air quality is poor. The label is required in order to allert the occupant that the control operates the indoor air quality ventilation fan for the dwelling and it should not be turned off unless the outdoor air is very poor. Staff finds that maintaining alignment with ASHRAE 62.2 by allowing such a fan (that may otherwise be expected to run continuously) to be shut off when conditions warrant is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222734	Bruce Severance	Section 120.1 IAQ & ASHRAE 62.2: The most affordable ERV model, the Panasonic FV04VE1 costs only $320 and would meet the requirement in most small homes given the infiltration credit. This cost is about the same as two bath fans, and includes a 70% efficiency heat exchanger.	Staff finds that ASHRAE 62.2 includes direction for ventilation system types used for providing the required whole-dwelling unit indoor air quality ventilation airflow. ASHRAE 62.2 allows use of supply, exhaust, andbalanced system types. Builders are allowed to select any ventilation system that provides the required ventilation airflow regardless of the system cost; staff would expect cost effective options, such as those suggested by the commenter, to be chosen in the majority of cases. To the extent that the commenter is suggesting limiting the options provided by ASHRAE 62.2, staff does not find that narrowing available options under ASHRAE 62.2 would be appropriate or justified based on this comment.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Section 120.1 IAQ & ASHRAE 62.2: THERE ARE SIGNIFICANT SAFETY CONCERNS with supply only or exhaust only ventilation: A supply only scenario can force humid interior air into the wall assemblies where it may accumulate for long periods of time and condense in areas where exterior foam is thin and thermal bridges are inevitable. Exhaust only scenarios will depressurize the home and can cause combustion flues to backdraft and fiberglass or cellulose particulate infiltration from the attic and wall cavities. If there is a crawlspace, there is a statistical probability that 40% of the “fresh air” entering the home will come from the crawlspace, obviously not a good idea. These issues also highlight the importance of providing air sealing checklists that include sealing all electrical J-boxes and caulking the base of the drywall to prevent infiltration or exfiltration at these points.	Staff finds that ASHRAE 62.2 includes direction for ventilation system types used for providing the required whole-dwelling unit indoor air quality ventilation airflow. ASHRAE 62.2 allows use of supply, exhaust, and balanced system types in all dwelling unit types including single family detached dwelling units and multifamily attached dwelling units. Direction for air sealing given by ASHRAE 62.2 section 6.1 and Title 24 Part 6 Section 110.7 specifically addresses infiltration issues such as those raised by the commenter. Staff does not find evidence that following this direction will result in significant safety concerns or cause the scenarios described by the commenter to be likely to occur. (Staff separately notes that checklists would not be appropriate as regulatory language, but may be considered as a possible guidance document; staff has forwarded the comment on to appropriate personnel.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: Chart 9-7 in the 2016 Res Compliance Manual erroneously requires solar thermal preheating when HP water heaters replace a gas water in CZ 16. This requirement is fraught with engineering failure modes. Not only is a solar thermal system likely to be frozen much of the winter in CZ 16 and will therefore experience more stress and lower productivity, preheating water for HP water heaters prevents full phase change of refrigerants and causes damage to compressors. The only practical heat pump water heater for this climate zone is the SanCo2, which can perform at a COP of 4.5 to 5.5 and can remain in heat pump mode down to an outside ambient temp of -15f. The 2019 Compliance Manual should avoid recommending solar preheating of HP systems, especially in this climate zone.	Staff notes that this comment appears to be in relation to the Compliance Manuals and not to regulatory language; the Compliance Manuals will be updated following adoption of proposed changes to Part 6, and will be subject to their own public comment period. Staff additionally notes that this is an option for homeowners provided as an example in the 2016 Compliance Manual, not a requirement. Staff finds that while this comment might be true for some CZ16 locations, there are some locations where this will be a workable option. Staff invites the commenter to participate in the public review of the Compliance Manuals when they are made available.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: HP water heaters combined with enough PV solar to power it is cheaper to install and maintain than traditional solar thermal systems for all single family applications. This has been the case for over 5 years yet the current incentives offered are pushing solar thermal systems when they are more costly and prone to failures. There are high-temp commercial and multi-family scenarios where solar thermal may still make sense. The introduction of the SanCo2 HP water heater is going to encroach on at least some of those applications but cannot be used with solar pre-heating.	Staff notes that incentive programs for solar thermal are not part of Title 24 and not related to this rulemaking. Staff also notes that the Sanden CO2 heat pump water heater can be modeled in the Energy Commission's performance modeling software and can be used as a prescriptive option.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: Preheating water with solar thermal systems not only reduces the efficiency of heat pump heaters, it can damage their compressors by preventing sufficient heat extraction from the coil to allow full phase change of the refrigerant. Solar thermal can't be combined with heat pump water heaters without major efficiency compromises as well as system failures.	Staff finds that neither the current nor proposed Part 6 language requires combining solar thermal water heating with heat pump water heaters; staff additionally notes that heat pump water heaters need to engage in reheat after standby losses, which necessarily means adding heat to already hot water, and that most hot water draws leave significant amounts of heated water in the tank. Heat pump water heaters must already accommodate different entering water temperatures (to account for location and seasonal variation), and entering water that is above the cutoff temperature would simply cause the water heater not to engage in reheat until the water had cooled (per its ordinary operation). Staff therefore is not able to determine why pre-heated water would pose a hazard that is not present during ordinary reheat given that most reheat is performed on heated water, and therefore does not find that adding language to address this circumstance would be necessary or appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: Prescriptively requiring solar thermal pre-heating in multi-family central systems and in high-rise commercial buildings precludes the use of electric heat pump water heaters which are up to 5.5 times more efficient than direct electric heaters and likely have lower cost and lower TDV than gas heaters in many climate zones and applications.	Staff is developing a modeling capability to analyse central heat pump water heating system. We currently do not have the capability, therefore cannot offer a prescriptive option at this time. There are also design and installation concerns with central HPWH that must be addressed. We added language to allow system determined to be equivalent to be used prescriptively.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: Solar thermal is still cost effective for high-temp commercial applications such as laundromats and lower-temp applications such as pool heaters, especially in climates where snowfall is rare.	We currently do not have solar thermal requirements for other commercial applications, and it is outside the scope of this rulemaking	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Solar Thermal Hot Water Heating Systems: The code should allow flexibility to choose between solar thermal and PV-powered HP DHW systems and allow these design trade-offs to be evaluated and traded off on a case by case basis. It should include in its definition of "solar hot water systems" technologies that employ heat pump water heaters powered by photovoltaic solar panels.	Staff is developing a modeling capability to analyse central heat pump water heating system. We currently do not have the capability, therefore cannot offer a prescriptive option at this time. We added language to allow system determined to be equivalent to be used prescriptively.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	State approved compliance software does not even allow you to model full slab insulation and the software design is missing significant energy savings for which there is case study evidence. The Passiv Haus Institute software called "PHPP" could be offered as an approved alternative to immediately allow compliance credit in homes that incorporate full passive home features. Obviously, it would be best if CBECC algorithms incorporated these variables.	Staff notes that this comment relates to the Energy Commission's building modeling software and not to proposed amendments to regulation. Staff confirmed that the feature (ability to model slab insulation) is under development; availability of this feature will depend on the availability of resources to dedicate to software development.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	The 2019 CBECC software considers some specific passive house design features such as orientation and window shading, but completely misses the most critical issues: insulation of the thermal mass which most commonly includes free-standing masonry walls or full under slab insulation (R-7 to R-10), including isolation of the floor slab from the perimeter footing. It appears that the modeling and the energy code overlook the temperature stabilization impacts of passive home designs that incorporate insulated thermal mass.	Staff notes that this comment relates to the CBECC modeling software and does not relate to the Express Terms; staff has passed this recommendation on to the software team.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	1. The biggest challenge may be getting recessed sprinkler heads UL approved that do not leak air and that prevent vapor drive from getting into cathedral ceilings. The state should move quickly to encourage sprinkler head manufacturers to solve this product development challenge. 2. In the meantime above deck exterior foam should be required on all cathedral ceilings and below roof decks that are over habitable space to prevent condensation in these types of ceiling assemblies.	1. Staff notes that air leakage in sprinkler heads has been previously investigated by both the California Energy Commission and the State Fire Marshall, and was found to have only minimal benefits while posing serious safety risks. Staff is intentional in not imposing requirements on fire suppression equipment such as sprinkler heads in Part 6. 2. Staff finds that the performance approach is intentionally agnostic with regards to specific types of insulation, and ensures that overall building efficiency is achieved regardless of specific design decisions such as use of (or insulation of) cathedral ceilings. Staff finds that appropriate design and construction will avoid issues of condensation noted by the commenter while also complying with Part 6.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	The code should also provide a more detailed checklist of air sealing measures at the vapor barrier and drywall, including the use of fire-retardant caulking to seal the back of J-boxes and subpanels as well as the joint between J-boxes and the drywall, especially in projects where exterior foam is required.	Staff does not find that checklists are appropriate inclusions into regulatory language; to the extent that this comment may relate to the Compliance Manuals or to the compliance documents developed and published by the Energy Commission, staff has passed this feedback on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	The code should provide some discussion of exterior foam attachment requirements and make recommendations for angling exterior fasteners upward and use of large washers or batts to distribute the point loads the fasteners which simultaneously creates capillary breaks or rain screens to allow the assembly to dry and release vapor drive as required by manufacturers. The failure to attend to any of these details can lead to catastrophic water damage and failure of the assembly as well as voiding of some product warranties.	Regulations must either compel or prohibit an act; staff finds that "recommendations" are not appropriate to include in regulatory code. If the commenter is intending to propose that these recommendations be included in the Compliance Manual (where it would be appropriate to state recommendations and best practices that are beyond minimum compliance with energy efficiency standards), staff notes that the Compliance Manuals will be updated following adoption of proposed changes to Part 6 and will be subject to their own public comment period. Staff invites the commenter to participate in this process.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	The energy code does not address or discuss vapor drive entrapment in wall cavities as it relates to permeability of exterior foam and the need for capillary breaks between the exterior moisture barrier and the XPS foam to facilitate drying of the assembly and vapor drive release. Most concrete siding manufacturers require air gaps in the assembly behind the siding to allow drying; otherwise concrete siding products are known to fail. Illustrations need to include these details. The assumption is made that vapor drive is not an issue if there is exterior foam to mitigate against condensation in the wall assemblies, however, exterior foam does not eliminate all thermal bridges in the assembly, such as framing protruding through the foam at window and door openings and in eaves. Also, it is conceivable that occupants may leave for a winter vacation leaving the heat turned down low enough to result in condensation in wall cavities at the interior surface.	Staff finds that manufacturer installation protocols address vapor drive entrapment; to the extent that a given installation experiences an issue with entrapment, this would be a health, safety and warranty issue to take up with the builder, similar to any other case where improper installation creates an unintentional and avoidable harm. Staff does not find that additional language addressing this circumstance is necessary or appropriate to include in Part 6.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	The slab insulation section drawings included in the 2016 Residential Compliance Manual are incorrect. The code requires sand between the horizontal foam and the poured slab to minimize cracking. Also, it is best to angle the top of the vertical foam that runs up the inside of the footing so that it is not exposed at the interior and does not result in damage to flooring materials when subjected to point loads caused by furniture that is often positioned against walls.	Staff notes that this comment appears to be in relation to the Compliance Manuals and not to regulatory language; the Compliance Manuals will be updated following adoption of proposed changes to Part 6, and will be subject to their own public comment period. Staff will pass the commenter's proposed correction to appropriate staff.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Unvented Attic Design Variables: Unvented attics should only be recommended in extreme climate zones (11-16). They should not be regarded as part of “conditioned space” as they are “indirectly conditioned”, and insulation at the ceiling plane should not be reduced or eliminated.	Staff does not find that use of unvented attics should be restricted by Part 6 to specific climate zones; staff notes that Part 6 does not "recommend" particular construction techniques, and no issues specific to milder climate zones and properly constructed unvented attics have been identified. The proposal for attic insulation is not to reduce or eliminate insulation but to relocate insulation from the ceiling to the roof deck, for the reasons noted in the Initial Statement of Reasons and the documents relied upon. The amount of insulation specified is based on maintaining or improving the overall thermal infiltration into the building and does not represent a decrease in stringency. Staff does not find that requiring additional ceiling insulation (i.e., in excess of cost effective thermal targets) where roof deck insulation is deployed to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018

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222734	Bruce Severance	Unvented Attic Design Variables: Vapor drive and humidity control in sealed, unvented attics may be an issue. Case study research has shown that humidity tends to migrate to the peak of the roof in cathedral ceilings and it is likely that humidity accumulated in unvented attics as well. It would cost less than $150 to install a 30cfm fan with a humidistat that exhausted air from the peak to the outside with make-up air entering through a duct with a gravity damper.	Staff finds that, given the marginal cost noted by the commenter, a cost analysis would be required for the Energy Commission to consider this proposal. Staff therefore invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding. (Staff separately notes that a study funded by the Energy Commission's EPIC program and conducted by researchers at Lawrence Berkeley National Laboratory did not find a moisture concern for appropriately designed unvented attics.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Unvented Attic Design Variables: Whole house fan systems normally vent to the attic, and in the case of an unvented attic, would have to be ducted directly to the outside through an end gable or dampered roof cap.	Staff notes that whole house fans are a prescriptive requirement; the prescriptive building package assumes a vented attic. While the commenter is correct that buildings designed with both sealed attics and whole house fans will likely need to include ducting for the fan, staff does not find that a change to regulatory language is necessary in relation to this.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222734	2/26/2018
222734	Bruce Severance	Cover email for TN 222734.	See TN# 222734 for responses.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222735	2/26/2018
222737	Steven Chong (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222737	2/26/2018
222758	Estee Schmaltz (Ei Group)	We feel it is imperative that solar is recognized as a major energy system and be afforded a mandatory HERS inspection in the upcoming 2019 code cycle.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222758	2/26/2018
222759	Estee Schmaltz (Ei Group)	It is imperative that the CEC ensures HERS Raters continue to provide solar inspections as we are most adequately equipped to collect the necessary data and report it to the CEC.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff also finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models). Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222759	2/27/2018
222760	Russell King (CalCERTS)	Section 100.0(A)3 – CalCERTS recommends clarifying this language. This section seems unnecessary. What kind of building is not unconditioned, indirectly conditioned, directly conditioned or a process space?	Staff finds that the categories of buildings specified in this section of the Scope map to unique sets of requirements within Part 6: there are distinct requirements for conditioned space, unconditioned space, and process space. Staff therefore finds that retaining the same distinction here maintains consistency between the Scope and these requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions - This section is intended to define what falls into this category, but as written, the word "shall" implies that altered systems must include all the system heating and cooling equipment, etc. It caused confusion among contractors who take it to mean that you must replace all of the equipment and not just parts of it. Suggested definition: Entirely New or Complete Replacement Space-Conditioning System: A system installed as part of an alteration, addition, or new construction that includes all new or replaced heating or cooling equipment, including but not limited to airhandler, condensing unit and cooling or heating coil for split systems; or package unit; plus an entirely new or replacement duct system (Section 150.2(b)1Diia).	Staff finds that the proposed definition contains directive language that would not be appropriate to locate in the Definitions section. Staff additionally finds that making substantive changes to "entirely new" or "complete replacement" could have far-reaching effects that exceed what is identified in the Notice of Proposed Action. Staff will consider adding a definition for "entirely new", and separately a definition for "complete replacement", as a part of the next rulemaking proceeding (and as a part of revising the language of provisions that make use of this phrasing).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – (similar to previous comment) CalCERTS recommends that a definition for Entirely New or Complete Replacement Duct System be added and that the following language be removed from section 150.2(b)1Diia: Entirely new or complete replacement duct systems installed as part of an alteration shall be constructed of at least 75 percent new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system, including but not limited to registers, grilles, boots, air handler, coil, plenums, duct material; if the reused parts are accessible and can be sealed to prevent leakage.	Staff notes that the Express Terms do not propose any change to the language referred to by the commenter; the intent of the language is to specify that when the project includes replacement of those systems, it is considered an "entirely new" system and thus the requirements of Subsections i and ii apply. Staff finds that editing this Section's language to remove the word "shall" would risk altering the scope or application of the Section in ways that are not identified in the Notice of Proposed Action, and therefore would not be appropriate; staff additionally notes that the language in question has been in the Energy Code for over ten years. Staff will consider comprehensively revising the language (in a manner similar to that suggested by the commenter) in the next rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – CalCERTS recommends that a definition be added for Zonal Control Compliance Credit, as used in the RCM, ACM, Residential Appendices and elsewhere. The definition should include that the credit applies to properly designed Zonally Controlled Central Forced Air System or by multiple systems that service separate zones.	Staff notes that the Residential Appendix only defines the term "zonal control", and defines it as "the practice of dividing a residence into separately controlled HVAC zones"; the definition then provides some examples of how this *may* be done, and notes that the benefit of doing so is modeled within the Energy Commission's Compliance Software. Staff finds that attempting to define a "zonal control compliance credit" in regulatory code, rather than noting that the modeling software provides an accurate estimate of the value of zonal controls, would require language beyond a definition of a term (given that the term is not presently used within Part 6). In addition, "proper design" implies specific criteria that is not identified by the commenter. To the extent that the commenter is proposing to specify a credit beyond modeling software consideration, and to specify the criteria for which it applies, staff invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – CalCERTS recommends that a definition be added for Zonally Controlled Central Forced Air Systems, as used in Section 150.0(m)13C and elsewhere. Suggested definition: Ducted space conditioning systems with a single air handler that is able to automatically control airflow through different ducts by means of motorized or actuated dampers. These may or may not meet the requirement for the Zonal Control Compliance Credit.	Staff finds that the use of this term in the noted Section is clear and unambiguous in its plain language meaning (a central forced-air system that is zonally controlled), and that defining the term in Section 100.1 is therefore not necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – CalCERTS recommends that a definition for Entirely New or Complete Replacement Space-Conditioning System be added and that the following language be removed from section 150.2(b)1C: installed as part of an alteration, shall include all the system heating or cooling equipment, including but not limited to condensing unit and cooling or heating coil for split systems; or complete replacement of a package unit; plus entirely new or replacement duct system (Section 150.2(b)1Diia); plus a new or replacement air handler.	Staff notes that the Express Terms do not propose any change to the language referred to by the commenter; the intent of the language is to specify that when the project includes replacement of those systems, it is considered an "entirely new" system and thus the requirements of Subsections i and ii apply. Staff finds that editing this Section's language to remove the word "shall" would risk altering the scope or application of the Section in ways that are not identified in the Notice of Proposed Action, and therefore would not be appropriate; staff additionally notes that the language in question has been in the Energy Code for over ten years. Staff will consider revising the language in a manner similar to that suggested by the commenter in the next rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – CalCERTS recommends that a definition for multi-family be added and that the definitions of single family, multifamily, townhouse, low-rise residential, and high-rise residential be carefully reviewed to resolve any ambiguities or conflicts between them.	Staff finds that proposing a definition for "multifamily" that differs from the use of the term in other Parts of Title 24 (as well as referenced national standards documents) risks creating inconsitency and conflict between code provisions and requirements, and goes beyond the changes identified in the Notice of Proposed Action. Staff, for this reason, finds that developing a definition for use in Part 6 is best treated as a code change proposal, meaning that questions of conflict, cost and benefit are transparently analyzed and the analysis placed in front of stakeholders and decisionmakers for consideration. Staff does not find that drafting and proposing a definition absent this analysis and stakeholder participation would be appropriate; staff will discuss this topic with stakeholders for possible inclusion in the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – CalCERTS recommends that the definition of ACCESSIBLE be amended as follows: ACCESSIBLE is having access thereto, but which first may require removal or opening of access panels, doors, or similar obstructions. For the purposes of duct sealing, accessible does not include ducts that can only be accessed by the removal of drywall or other permanently installed building material, ducts in an attic that are not visible from a catwalk or other form of standing platform, ducts in a crawlspace that has less than 18" of horizontal or vertical clearance, ducts suspended more than 16 feet' above a floor, or ducts on a roof more than 16 feetabove grade that do not have a permanently installed access ladder, stairs or access door.	Staff finds that the circumstances noted by the commenter are already precluded when using the dictionary definition of "accessible"; staff therefore does not find that a non-dictionary definition is necessary, and that more specifically defining the term risks creating situations where because the reason a duct is inaccessible is not listed in the definition, it must instead be treated as accessible. (Staff can consider providing additional direction, such as that proposed by the commenter, in the Compliance Manual or in other advisory documents.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 100.1(b) Definitions – This section is intended to define what falls into this category, but as written, the word "shall" implies that they must be constructed of at least 75 percent new duct material, etc. Suggested definition: Entirely new or complete replacement duct systems: An altered space conditioning system that includes 75 percent or more new or replaced duct material, by length, and all new, replaced, and remaining existing ducts are accessible and can be sealed to prevent leakage. Note: This definition is repeated in the nonresidential section 141.0(b)2Di	Staff finds that the proposed definition contains directive language that would not be appropriate to locate in the Definitions section. Staff additionally finds that making substantive changes to "entirely new" or "complete replacement" could have far-reaching effects that exceed what is identified in the Notice of Proposed Action. Staff will consider adding a definition for "entirely new", and separately a definition for "complete replacement", as a part of the next rulemaking proceeding (and as a part of revising the language of provisions that make use of this phrasing).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 10-103(b)1A – CalCERTS recommends adding language that allows documents to be shared via e-mail, electronic transfer, or providing a link.	Staff does not find that the methods suggested by the commenter provide the same assurance that the documents will be readily available to, and received by, the homeowner: the proposed use of a link or transfer site presupposes that the link or site will be maintained in perpetuity, with little recourse if the site later goes down or becomes unavailable. A builder also is unlikely to have e-mail addresses for all future owners at the time of inspection, meaning that delivery of a later e-mail is not verifiable by building officials in the same way that an on-site copy is. (Staff notes that these formats can be included *in addition to* an on-site copy, and that the on-site copy can be present on an inexpensive thumb drive.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222760	Russell King (CalCERTS)	Section 150.2(b)1H Water-Heating Systems – CalCERTS recommends a careful review of this section. The current language causes a great deal of confusion. We would be happy to provide specific edits that do not change the current intent upon your request. For example: The first sentence ends with the word shall, but the following list of individual requirements each contain the word "shall". Section 150.2(b)1Hii –As written the word "shall" implies that you must install a demand recirculation system with manual on/off control. Suggested language: When a recirculation distribution system serving individual dwelling units is installed . . . Section 150.2(b)1Hiii reads: "Altered or replacement water heating systems shall meet one of the following requirements:" but then goes on to lists types of water heaters, not requirements.	Staff has conducted an additional review pass and made additional edits for clarity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222760	Russell King (CalCERTS)	Section150.1(c)14 – CalCERTS strongly recommends that language be included in this section that requires third party verification of the performance of the PV systems and that JA11 be moved to the Residential Appendices and all responsibilities assigned to the enforcement agency be re-assigned to HERS raters.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222760	2/27/2018
222764	Laura Neish (350 Bay Area)	Because of the importance of grid interconnection for ZNE buildings, including load shifting, we strongly support the CEC section 110.12(a) requiring an open ADR 2.0 standard.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222764	2/28/2018
222764	Laura Neish (350 Bay Area)	If the CEC is serious about California's climate change policy it will do everything feasible in this year's title 24 update to assure a level playing field, or better, a playing field which recognizes the real costs of continued investment in natural gas infrastructure	Staff finds that the analyses performed in support of the 2019 amendments to Title 24 Part 6 accurately account for associated costs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222764	2/28/2018
222764	Laura Neish (350 Bay Area)	We strongly urge that the update emphasize establishing an accurate cost accounting for natural gas, including the cost of new infrastructure for homes not currently using natural gas. All cost effectiveness analyses should use the Social Cost of Carbon (SCC) determined by an independent scientifically credible transparent process, consistent with what the California Air Resources Board uses for SCC.	Staff finds that current methods accurately capture the costs paid by consumers for energy.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222764	2/28/2018
222764	Laura Neish (350 Bay Area)	We strongly urge that the update emphasize that all buildings must be electrification ready.	Staff finds that the Express Terms contains several amendments that either ensure electrification readiness, such as the inclusion of an electrical conduit when gas water heaters are installed, and amendments that remove requirements to include or install gas connections, consistent with the commenter's suggestion. To the extent that the commenter is proposing that additional specific "electrification readiness" requirements be adopted, staff invites the commenter to submit a complete code change proposal inclusive of any necessary cost benefit analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222764	2/28/2018
222764	Laura Neish (350 Bay Area)	We strongly urge that the update recognize the key role of heat pump water heaters (HPWH) for both energy efficiency gains and for their potential to provide valuable grid services such as load shifting when connected to the grid, not just drainwater heat recovery systems. Section 150.1 (c) 8A should be rewritten to exclude the requirement for additional rooftop solar PV kW when new construction includes a grid connected HPWH. This requirement creates an unnecessary disincentive since a grid-connected HPWH can offset higher generation needs given its potential for thermal storage.	Staff recognizes that there are benefits provided by grid connected HPWH; staff is currently working with the Natural Resources Defense Council (NRDC) to develop a compliance option for this equipment. However, as the work to assess an appropriate valuation of this benefit is ongoing, until that work is completed staff cannot assign an appropriate credit in the software, nor justify a code provision that relies on this feature to reach parity. Staff therefore has provided an alternative to additional solar rooftop PV, consistent with the commenter's suggestion, though based in compact distribution design and drain water heat recovery rather than on grid-connected features.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222764	2/28/2018
222765	Mark Lundberg (Field Controls)	Before the 2019 residential energy code goes into effect, it is imperative that Central Fan Integrated systems for mechanical ventilation (CFI) be properly modeled in the performance software. Current CBECC-RES software overstates the incremental energy use of CFI systems by a factor of 4 or more, according to a recent analysis, presented here. While this incremental energy use does not currently disqualify CFI systems from use, since the reference building is also modeled with a CFI system, the addition to the 2019 residential energy code for new construction of prescriptive PV production to offset electric usage is a major change that will make CFI systems costprohibitive in the State.	Staff notes that this comment relates to the Energy Commission's building modeling software and not to proposed amendments to regulation.Staff communicated with the commenter; the nature of the comment was a misunderstanding of how the software functioned resulting from incorrect information provided by third party software support personnel. This caused the commenter to question the results they were getting from the energy model. Staff explained that the central fan integrated indoor air ventilation feature had not been implemented in the software and committed to addressing in future proceedings relating to the compliance software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222765	2/28/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222769	Eric Truskoski (Bradford White)	BWC strongly recommends CEC reconsider applying additional requirements for one technology versus another. For instance, insulated piping and drain water heat recovery are required for storage type water heaters but not tankless water heaters. This results, at least indirectly, in CEC picking technology winners and losers.	Staff finds that Part 6 is technology neutral: the different prescriptive options for gas water heating provide the same level of performance for the water heating system. The additional requirements for storage water heaters below 55 gallons (stated in Section 150.1(c)8A2) is needed because of the lower level of performance of this class of water heater; staff, after further analysis, has removed the additional criteria for storage water heaters above this threshold, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222769	2/28/2018
222769	Eric Truskoski (Bradford White)	We do not support the removal of the option of a gas storage water heater with a capacity less than or equal to 55 gallons. There are high efficiency products that fall into this category that provide the same utility as the other products being biased and still contribute to the overall goal of saving energy. We also believe this proposal infringes on federal preemption. We feel it is also important to provide consumers with less expensive options that still result in forward progress, especially since the cost of living in California is significant and continues to climb.	Staff does not find that the removal of this section violates federal preemption: this class of product is not banned because it can still be modeled under the performance standard. That said, staff has developed a replacement specification for this class of water heater, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222769	2/28/2018
222769	Eric Truskoski (Bradford White)	We find it concerning that the code currently favors tankless technology when these products do not discourage the use of excessive water when the state is in a drought and supports the purchase of products that are currently and exclusively manufactured overseas. Given the behavior difference for tankless water heaters leading to the use of more water, it further begs the question, “why isn’t drain water heat recovery required for tankless water heaters as well?” We welcome discussions on how we can modify the code to achieve CEC’s goals while maintaining consumer choice and energy efficiency.	Staff finds that this comment was previously made and addressed in the 2016 rulemaking. The proposed regulations do not require installation of a instantaneous water heater, and the NREL report referenced in the 2016 rulemaking record shows that instantaneous water heaters do not result in additional water use when installed.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222769	2/28/2018
222769	Eric Truskoski (Bradford White)	We support the inclusion of electric heat pump water heaters as an option.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222769	2/28/2018
222769	Eric Truskoski (Bradford White)	We’ve received feedback that additional pipe insulation is not always installed correctly the first time as confirmed by an auditor. This requires both the installer and auditor to visit the site a second time. This drives up the installation cost and dissuades individuals from dealing with the perceived headache of installing pipe insulation altogether, which prevents them from installing a storage water heater	Staff finds that the commenter misunderstand this requirement: pipe insulation is a mandatory requirement for all hot water pipe, as specified in both the Plumbing Code and the Energy Code. For specified piping (primarily piping under 1" in diameter), the Energy Code specifies a higher minimum insulation value than the Plumbing Code (primarily, the Plumbing Code specifies insulation matching pipe diameter while the Energy Code specifies a minimum of 1" for 3/4" piping, as well as 1/2" piping in specific circumstances). This is not a requirement to add more insulation at a second step, but an expectation that small diameter piping will have at least 1" of insulation.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222769	2/28/2018
222776	David Mann (FSC and ACC)	Based on long-standing industry experience, accepted practices, and current building code provisions, the FSC can find no basis for either eliminating the above deck roof insulation option or for failing to modestly increase the R-values as actually recommended in the CASE report.	Staff finds that product availability remains a concern, and for this reason staff is not proposing to increase the prescriptive requirement at this time. The prescriptive requirement is based on an R-19 below roof deck insulation, and a higher R-value in above-deck insulation is not necessary for equivalent performance.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222776	2/28/2018
222776	David Mann (FSC and ACC)	The FSC recognizes that the Title 24 addresses these types of roof systems as “Option A – Continuous Insulation Above Roof Rafters” in Table 150.1-A. The description in Table 150.1-A also applies to a more unique application of continuous insulation located above the roof rafters and below the roof deck or sheathing. This latter application may require additional structural considerations which would not be necessary with above-deck options described above. But, such matters are appropriately and routinely addressed in the building code and code evaluation process, not the energy code. Thus, it would be inappropriate to remove all forms of above deck insulation on the basis that one type of application may require additional approvals through the building code which reputable manufacturers are accustomed to doing.	Staff met with representitives of FSC and ACC and explained the reasoning for removeing the above deck insualtion. The above deck insulation option was removed from the Prescriptive package because: 1. it was not part of the original cost effective study for the prescriptive package. 2. It caused confusion in the building industry on how to use it in the prescriptive paths since building using the proposed sytems out in the market would not be able to meet the structural requirements. If and when a product does become available that can be used for above deck insulation, the performance compliance approach can be used to allow this installation. For these reasons, staff did not find that including this measure as a prescriptive option would be appropriate; staff will revisit in future code cycles as new roofing systems are developed and technical feasibility concerns are addressed.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222776	2/28/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222776	David Mann (FSC and ACC)	The FSC suggests revising the staff recommendation regarding the above-deck roof insulation prescriptive option. We also recommend improving its utility by including simple prescriptive applications for above deck roof insulation for unvented, conditioned attics which would maximize goals for energy efficient, high-performance roofs with ducts entirely within conditioned space. Such provisions are already addressed in the International Residential Code (Section 806.5 "Unvented attic and unvented enclosed rafter assemblies"). Removing the above-deck continuous insulation option would be a step away from more options for cost-effective, highperformance attics. Therefore, the FSC requests that the staff recommendation in Docket No. 17-BSTD-02 be reconsidered and revised accordingly.	Staff met with representitives of FSC and ACC and explained the reasoning for removeing the above deck insualtion. The above deck insulation option was removed from the Prescriptive package because: 1. it was not part of the original cost effective study for the prescriptive package. 2. It caused confusion in the building industry on how to use it in the prescriptive paths since building using the proposed sytems out in the market would not be able to meet the structural requirements. If and when a product does become available that can be used for above deck insulation, the performance compliance approach can be used to allow this installation. For these reasons, staff did not find that including this measure as a prescriptive option would be appropriate at this time; staff will revisit in future code cycles as new roofing systems are developed and technical feasibility concerns are addressed.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222776	2/28/2018
222779	Kyle Kilby (Energuy California)	I believe the updated Standards should extend HERS verifcaton requirements to solar photovoltaic systems and bateries.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222779	2/28/2018
222787	Aliyah Quiroz	We believe the updated Standards should extend HERS verification requirements to solar photovoltaic systems and batteries.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222787	2/28/2018
222791	Dan Ochipinti	I hope that you will reconsider the plan to no longer require HERS verification of solar PV systems. NSHP programs, in particular, need third party verification to keep solar installers honest. Underfunded building departments do not have the time or training to do verification, and HERS raters are the logical choice to conduct verifications. Keep solar PV verification to HERS raters!	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff also finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models). Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222791	2/28/2018

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222792	Walt Vernon	I well understand that the state of Calfironia has, through administrative accident, failed to regulate hospitals' energy consumption for decades, thus accustoming this industry to being able to ignore the regulations. I understand the concern for easing into a new regulatory regime. I accept the judgment of the CEC and OSHPD that the proposed set of regulations is the best path forward, given the historical circumstances. I am not happy about it, and i think it falls well short of the law, and well short of the way we Californians like to think of ourselves, but if it is the necessary first step, then i support it. In the spirit of compromise, I endorse the proposed changes.	Staff appreciates the comment of support; staff anticipates working closely with OSHPD over future code cycles on improving and expanding energy efficiency standards for healthcare facilities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222792	2/28/2018
222792	Walt Vernon	The California Energy Commission to require California hospitals to comply with certain elements of California Title 24 Energy requirements do not go far enough. The US Department of Energy requires every state to pass regulations equivalent to ASHRAE 90.1, the most recently certified edition. The CEC proposals fall well short of this mark.	Staff finds that the health and safety of patients and healthcare providers is the most important aspect of any requirement for healthcare facilities, and that compared to efficiency standards in other contexts, additional time is required to ensure that the current proposal does not have any unintended consequences. Staff therefore plans to work with OSHPD to observe the impact of the proposed Express Terms and to continuously improve the standards applicable to healthcare facilities over multiple code cycles; staff does not find that moving directly from no energy efficiency requirements to full 90.1 alignment would be appropriate for healthcare facilities.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222792	2/28/2018
222797	Matthew Christie (CABEC)	CABEC is concerned that the language stated in §150.1(b)3Bv regarding Heat Pump Rated Heating Capacity may cause a compliance issue. We would like to encourage the Energy Commission to develop default heating capacity values, or a calculation method to determine maximum 47 degrees F and 17 degrees F values for heat pumps, so that energy consultants would not trigger the Heat Pump Capacity HERS verification unknowingly. This could be accomplished through the performance software by providing a check box that will apply default values for heating capacities through an auto-sizing function to develop the capacities. (see suggested language page 3)	Staff notes that this is a comment relating to compliance software and not to proposed amendments to Part 6. Staff has passed this comment on to its software team.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018
222797	Matthew Christie (CABEC)	CABEC is concerned that the language stated in §150.2(a)1A regarding additions greater than 700 ft. meeting the prescriptive requirements in §150.1(c), which include QII may cause a compliance issue. We would like to encourage the Energy Commission to include the following modifications to §150.2(a)1A: iv. Newly conditioned spaces, additions that consist of the conversion of existing spaces from unconditioned to conditioned space (e.g. garages, basements) do not need to meet the following sections of RA3.5: • Window and door header requirements where existing wall sections are converted to exterior walls adjacent to conditioned space (Sections RA3.5.3.2.9, RA3.5.4.2.9, RA3.5.5.2.9, RA3.5.6.2.9, RA3.5.7.2.7, and RA3.5.8.2.7). • Air sealing of inaccessible areas of existing wall sections, including wiring and plumbing penetrations not accessible to sealing. (Sections RA3.5.3.2a, RA3.5.4.2a, RA3.5.5.2a, RA3.5.6.2a).	Staff has added a provision (Section 150.2(a)1Aiv) adressing QII and specifying the exceptions specified by the commenter, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018
222797	Matthew Christie (CABEC)	CABEC's Advocacy Committee and Board of Directors harbor an overall concern about the complexity and enforceability of certain aspects of the energy code compliance documentation process and formally request that staff involves CABEC representatives in the process of developing the compliance software, the compliance forms, and the compliance manuals, work that will happen in the near future.	Staff will advise and invite CABEC with regards to participating in development of the supporting Compliance Manuals, compliance documents and CBECC software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018

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222797	Matthew Christie (CABEC)	We recommend that applicable ventilation rate equation referenced in section 4 of ASHRAE 62.2 be included in §150.1(o), and any supporting procedures necessary for determining the ventilation airflow rate be added to the Residential Appendices and referenced in §150.1(o).	Staff has added the noted equations to Section 150.1(o), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018
222797	Matthew Christie (CABEC)	We strongly support the CEC's goals of ZNE and the method by which they are achieving them.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018
222797	Matthew Christie (CABEC)	We would like to encourage the Energy Commission to require a HERS rater to verify the installation of PV systems.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222797	3/1/2018
222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	We applaud (support) the Commission's reconsideration of the proposal about correlated color temperature (CCT) for integrated LED (inseparable) luminaires.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018
222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	a. Outdoor Lighting Power Allowance: We mostly support using LED technology as the baseline for the outdoor lighting power allowance and believe the proposed values of Table 140.7-A and B will be achievable by 2019. However, the values are too aggressive and will restrain design flexibility for lighting applications using decorative post tops and historical post top luminaires. We propose an adjustment factor of 1.2 for installations using decorative post tops and historical post top luminaires. Section 140.7	Staff finds that decorative/historical post top luminaires were analyzed and accounted for in the lighting power analysis for supporting the proposed values of Table 140.7-A and B. For this reason, staff does not find that an adjustment factor is necessary for these and similar luminaires to be installed prescriptively. (Staff notes that the proposed lighting power allowances are based on middle-performing LED technologies, meaning that more efficacious lighting elements are available that can be used to balance any reductions in lumen-per-watt output attributable to installation within a historical form factor.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018
222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	1. Previously luminaires with wattage less than 150W exempt from the maximum zonal limits for uplight and glare. In general "initial lumens" values are not available on luminaires spec sheets or other marketing materials. In some cases, the lumen value of the product is not stated in lieu of providing lumen package option values. 2. We urge the Commission to review luminaire wattage data for multiple LED luminaire types, specifically decorative post tops, and move forward with an exemption to ensure that the threshold does not eliminat the use of decorative historical or other specialty type of products from code. The proposal is a significant % reduction from the previous standard. Propose to set the exemption threshold at maximum 70W and 6500 lumens. Section 130.2(b)	1. Staff does not find that the difference in presentation of lumen value creates a challenge in determining when BUG standards apply, nor in disclosing this information to designers. For lighting manufacturers who provide the BUG rating information on luminaire spec sheets or other materials, the same BUG rating information can be used for the determination in meeting the BUG rating requirements. For other manufacturers who choose not to include the BUG rating information on the luminaire spec sheet or marketing materials, lighting designers can determine the BUG rating with the luminaire photometric information that is routinely prepared and provided by manufacturers: when this data is a range, it is straightforward to understand that models specified above the regulatory threshold must be appropriately rated. 2. Staff notes that post-top luminaires were included in analysis that determined the 5500 initial lumen threshold. Further, the exemption is based on the output of legacy products previously exempted by code and it is comparing like kind with like kind. That said, staff has revised this threshold to 6200 to better account for anticipated lumen maintenance, consistent with (though not at the same specific value as) the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018
222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	Remove clause 110.12(a)(2) due to ambiguity and inconsistent interpretations.	Staff has made edits to the phrasing of the noted section to improve clarity, consistent with addressing the commenter's concerns about ambiguity and conflict; staff does not find that foregoing the section entirely to be appropriate, as the specification being made is essential for ensuring a basic ability for signals to reach the control.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018

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222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	We believe the rewrite of the requirements (lumen maintenance, rated life, and survival requirements) still leaves the testing requirements vague, confusing and incomplete for luminaires with integrated sources. 1. Not all integrated LED luminaires that fall under the scope of JA8 in Table 150.0-A fall under the scope of the Energy Star Luminaires specification. 2.These products (LED pendants and panels) should also be allowed to use IES LM-80 test method and TM-21 projections. JA8.3.5	1. Staff has revised how light sources that fall outside of the scope of both ENERGY STAR life tests are directed to be tested, consistent with comments from this and other commenters. (Staff recognizes that lighting devices will fall outside the ENERGY STAR categories, and is intending to direct them to the ENERGY STAR test most able to be successfully performed.) 2. Staff finds that the revisions to JA8 have the effect of allowing any test method allowable under the referenced ENERGY STAR test procedures, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018
222807	Tanya Hernandez (Acuity Brands Lighting, Inc.)	In the 45-Day language, the exception for the Survival Rate requirement granted for inseparable luminaires. It is not our belief that the Commission intends to impose an additional 9-month test to determine the Survival Rate for luminaires certified to JA8. JA8.4.5	Staff has revised the language in the Exception to Section JA8.4.6(c) to clarify its intent as well as the relationship between survivial rate requirements and interim test results; the commenter is correct that the Exception was not intended to extend test times, however staff notes that the ENERGY STAR requires continuation and completion of the test following reporting of interim results, and does not specify that the test may be terminated once interim results are recorded.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222807	3/1/2018
222808	Stephanie Smith (Energuy California)	We believe the updated Standards should extend HERS verification requirements to solar photovoltaic systems and batteries.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222808	3/1/2018
222809	Nate Colyott	I hope that you will reconsider the plan to no longer require HERS verification of solar PV systems. NSHP programs, in particular, third party verification is necessary to keep solar installers honest in all aspects. Underfunded building departments do not have the time or training to do verification, and HERS raters are the logical choice to conduct verifications and should continue to thrive in the future. Keep solar PV verification to HERS raters!	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost; staff additionally notes that HERS verification of solar photovoltaic systems has not been previously required under Part 6, and that the commenter is referring to a requirement for participating in the New Solar Homes Partnership which was an elective California program (for which HERS verification confirmed that the installed panels were from a specific prequalified list of models).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222809	3/1/2018
222810	Kelly Murphy (Steffes)	In order to sync and optimize that energy storage asset to the advanced inverter, a tank system may “read” or instantaneously react to what would have been curtailed PV energy. A regular DR signal may not come to the water heating system but it will instead react to the inverter which is either sensing grid instabilities or as a consequence of a utility (non OpenADR) command from the evolving Rule 21 smart inverter phase 3 communication protocol (currently SEP 2.0). As the Commission finalizes this Rulemaking, we suggest leaving room for innovation of one of the most flexible co-located storage options in order to accommodate what may end up being one of the most challenging aspects of the task ahead – buffering volatilities at the very grid-edge as DERs proliferate.	Staff has added language in Section 110.12(a)3 to expressly state that "[d]emand responsive controls may incorporate and use additional protocols beyond those specified in Sections 110.12(a)1 and 2", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222810	3/1/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222810	Kelly Murphy (Steffes)	Steffes has as very strong collaborative relationship with NRDC, but we do not agree with our colleagues on certain aspects of their most recent CEC submittal TN #: 222624. Specifically, we believe that NRDC is overly detailed in its Appendix: "Proposed Specification for Electric Water Heating with Load Management" and entirely too prescriptive in using the term "embedded" in regards to load management functionality.	Staff finds that this comment (similar to the NRDC comment to which it responds) is regarding the modeling of this equipment in the CBECC software, not to language within the Express Terms. Staff has therefore forwarded the comment on to appropriate personnel, noting that the NRDC language is not proposed to be included in the Express Terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222810	3/1/2018
222814	Sandra Meyer (City of Walnut Creek)	If the Commission supports this compliance pathway (community choice energy program MCE), it should outline what would happen if the project stopped complying and failed to purchase 100% renenewable electricity. To avoid Cities having to monitor the compliance of buildings on a regular basis, which would be an administrative burden, utilities and community choice energy programs may need to be able to designate properties or accounts that must use 100% renewable electricity to enswe long-term compliance.	Staff finds that, to the extent that a program approved under Part 1 Section 10-115 at some point stops complying with Section 10-115, the affected individuals would have grounds for seeking redress via the court system, where appropriate redress would be determined. Staff does not find that specifying redress in regulatory code would be appropriate. (Staff would expect applications for approval under 10-115 to include discussions of contingencies such as what occurs if the program is not followed.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222814	3/1/2018
222814	Sandra Meyer (City of Walnut Creek)	We support ensuring that compliance pathways are in place to allow for the installation of all electric appliances in new construction and building retrofits.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222814	3/1/2018
222814	Sandra Meyer (City of Walnut Creek)	We support the Commission providing compliance pathways so that mandatory solar photovoltaic requirements for individual buildings can be met with community solar or a utility/community choice energy program purchase of 100% renewable energy when it is not feasible to have solar on site.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222814	3/1/2018
222820	Lex Talionis	Having a manufacturer aggregate and subscribe individual VENs is invaluable to the customer. Requiring end users and building owners to provision their own uplink, and configure each site's devices to connect to a utility ADR head-end is an unnecessary burden. Services like Geli can provide more optimal energy usage plans for DR enabled systems at a more affordable price if we can connect to both utility head-end and the manufacturers cloud control instance via ADR, rather than require an end user to install a dedicated box.	Staff has added language to Sectioon 110.12 to allow for a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222820	3/1/2018
222823	Kelly Seeger (Philips Lighting)	Philips supports the use of NEMA 77 as an option to qualify products.	Staff is not proposing inclusion of NEMA 77 in the Express Terms owing to comments received expressing concerns with regards to use of this test procedure in place of JA10 testing.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222823	3/2/2018
222823	Kelly Seeger (Philips Lighting)	The use of a single universal limit for temporal light artifacts (TLA), that applies to all applications, all products, and varied light levels (dimmed conditions) should be chosen not based on the condition that requires the most stringent limit, but based on careful consideration of all conditions.	Staff notes that while NEMA 77 is more stringent than JA8 values for frequency range below 60 Hz, it is less strict than the current test procedure and standard for frequencies abow 60 Hz. Additionally, JA10 provides data that can be used to select products complying with more stringent IEEE PAR1789 low and no risk thresholds (based on the reported values at 400 Hz and 1kHz), which is not possible to do using the results of NEMA 77. Staff therefore does not find that reducing the stringency of current requirements or removing the ability for sensitive persons to self-select safer products would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222823	3/2/2018
222829	Rick Counihan (Nest Labs)	As proposed, Section 110.12(a) would create unnecessary costs, efforts, and security concerns by requiring the Nest thermostat to become an OpenADR VEN. Aggregation of devices is working and consumer protections are in place. The Commission should avoid imposing a market constraint that could considerably disrupt the significant, existing, and growing aggregator-based demand response market.	Staff notes that the minimum communication requirements specified in Section 110.12 are existing requirements previously specified in JA5 - staff finds that minimum communication requirements for such controls are appropriate, for the reasons stated in the rulemaking records under which they were adopted. Staff has added Section 110.12(a)1B to allow the use of a cloud-based VEN, consistent with the commenter's request for flexibility and with the full body of their comment letter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018

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222829	Rick Counihan (Nest Labs)	Government Code § 11346.2 (b)(1)-(3) (b) requires that an ISOR include, among other things: (1) a statement of the specific purpose of each adoption, amendment, or repeal, the problem the agency intends to address, and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose and address the problem for which it is proposed and the benefits anticipated; (2) an economic impact assessment; and (3) an identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the adoption, amendment, or repeal of a regulation. The record in this proceeding does not include these three analyses required for a substantial change, like imposing Mandatory OpenADR for devices to qualify as demand responsive controls under the Standards. Thus, the record does not meet the requirements for an admittedly "substantive" change to the existing regulations.	Staff finds that the requirements of Government Code Section 11346.2(b) are met by the proposed Express Terms, and notes that the specifications in Section 110.12 are existing specifications previously located in Joint Appendix 5.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Mandatory OpenADR represents a significant departure from current law and regulation that is not supported by either sound public policy or the record in this proceeding. The proposed changes may also stifle innovation in demand response.	Staff notes that OpenADR is specified in the existing text of Joint Appendix 5; staff finds that moving this requirement to Section 110.12 is therefore fully consistent with current law and regulation.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Nest encourages the Commission to make additional changes to JA5 that advance the energy efficiency capabilities of OCSTs. First, the Commission could adopt the Energy Star standard as a requirement for OCSTs.	Staff notes that an additional requirement to comply with ENERGY STAR specifications would be likely to impose additional compliance costs, and therefore that a cost analysis would be necessary in order to consider this proposal. Staff therefore invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Nest encourages the Commission to make additional changes to JA5 that advance the energy efficiency capabilities of OCSTs. A third option would be to use the EPA energy savings methodology, or similar methodology, to come up with a minimum energy efficiency level for thermostats in California.	Staff finds that additional design requirements for smart themostats are likely to impose additional costs; staff therefore finds that a cost analysis would be required in order for the Energy Commission to consider adopting thermostat energy efficiency requirements. Staff invites the commenter to submit a complete code change proposal including a cost analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Nest encourages the Commission to make additional changes to JA5 that advance the energy efficiency capabilities of OCSTs. Second, the Commission could require a series of capabilities for OCSTs that create the energy savings in Energy Star smart thermostats. (see page 13 for suggestion)	Staff finds that additional design requirements for smart themostats are likely to impose additional costs; staff therefore finds that a cost analysis would be required in order for the Energy Commission to consider adopting additional ENERGY STAR specifications. Staff invites the commenter to submit a complete code change proposal including a cost analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Nest respectfully challenges the premise that stranding can or will occur for demand responsive control devices without Mandatory OpenADR. Demand control devices are not being stranded as a result of their proprietary communications protocol, normally referred to as the "API" (application programming interface). There are very good reasons why, and real-world experience demonstrates, that the risk of stranding demand responsive controls is theoretical only. (see pages 4-8 for reasons)	Staff finds that proprietary controls create an inherent risk of stranding, and it is not clear that businesses would necessarily operate in the manner suggested by the commenter rather than considering it an opportunity to sell complete replacement equipment (that would not be needed if a non-proprietary method could be used to communicate with the device). That said, staff has added language to allow for a cloud-based VEN so that the acceptance of a non-proprietary signal can occur upstream of the on-site hardware.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	Nest understands that the Commission is focusing on Mandatory OpenADR, in part, because of consumer protection concerns. Nest shares this common interest in consumer protection. Without customer confidence, there is no demand response market. The proposed Mandatory OpenADR is not necessary to ensure the continuing protection of consumers and may, in fact, open the door to other significant consumer and policy concerns.	Staff does not find that the specification of OpenADR as a baseline minimum specification creates consumer or policy concerns; staff notes that this requirement is an existing requirement, and is only applicable to demand responsive controls installed to comply with Part 6 requirements. Staff has edited the language in Section 110.12 to more clearly state that additional protocols are allowed to be included and used, and as added language to allow the use of a cloud-based VEN to best maximize the flexibility of these systems.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018

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222829	Rick Counihan (Nest Labs)	The Commission's record fails to satisfy the requirements of the Government Code for a Mandatory OpenADR system. As one example, Government Code § 11346.2 (b)(5)(B) requires detailed cost analyses for new market constraints: If a proposed regulation is a building standard, the initial statement of reasons shall include the estimated cost of compliance, the estimated potential benefits, and the related assumptions used to determine the estimates. The Commission's record does not contain cost analysis of Mandatory OpenADR. Nest has been asked, "How much would it cost to add OpenADR to your thermostats?" The fact that the question is being asked is evidence that the Commission's record does not include a cost analysis of a Mandatory OpenADR requirement.	Staff notes that the cost analysis for specifying OpenADR is present in the rulemaking under which it was originally adopted; the rulemaking materials for prior rulemaking proceedings updating Part 6 are available on the Energy Commission's website.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	The existing Standards and the existing record support protocols capable of using a list of open-source standards. So long as these existing elements remain, the Commission has the authority to add to these existing requirements its desired references to OpenADR. Therefore, we propose the following changes to 110.12(a) based on the existing record: 110.12(a) Demand responsive controls. 1. All demand responsive controls shall be either: A. An OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification; or B. A device capable of responding to a demand response signal that originated via OpenADR 2.0a or OpenADR 2.0b. The originating signal may pass through one or more Virtual End Nodes, which may in turn communicate to the device or an intermediary in open source or proprietary signals.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222829	Rick Counihan (Nest Labs)	The Mandatory OpenADR proposal is admittedly a substantial change that requires a robust record not present in this case. The Initial Statement of Reasons ("ISOR") in this rulemaking does not include the required cost estimates for imposing Mandatory OpenADR on all demand responsive controls' communications protocols. The ISOR admits that the change to OpenADR is a significant change. This change is substantive, so, as required by Government Code § 11346.2 (b)(5)(B), there must be a cost analysis—which is simply not in the record.	Staff notes that the cost analysis for specifying OpenADR is present in the rulemaking under which it was originally adopted; the rulemaking materials for prior rulemaking proceedings updating Part 6 are available on the Energy Commission's website.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222829	3/2/2018
222830	Travis English (Kaiser Permanente)	The proposed the proposed 2019 Title 24 Part 6 revisions are less stringent than our internal standards. We do not anticipate their adoption will affect our design or construction practices, schedules, or costs to a significant degree.	Staff appreciates this information and feedback regarding compliance costs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222830	3/2/2018
222831	Michael Lindsey (IALD)	Section 130 (C), 5 – Classification & Power of Modular Lighting Systems: Reduce the value in 130.0 (c), 5, A, i. from 30 watts per linear foot to 8 watts per linear foot. This will mean that it will be much less likely that useless current limiters will need to be specified and installed. This will reduce the cost of construction because useless current limiters will no longer need to be installed to comply with code. This value of 8 watts per linear foot was adopted and recently published in IECC-2018 (http://shop.iccsafe.org/codes/2018-international-codes-and-references/2018-international-energyconservation-code.html)	Staff finds that, to the extent that a modular lighting system would be able to power incandescent luminaires, retaining a worst-case assumption is appropriate. Staff notes that alternate options are available under 130.0(c)6B and C that allow for lower ratings, and that C specifically allows for rating according to the power supply or driver thus accommodating LED-only systems; current limiters are not needed under this option, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018

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222831	Michael Lindsey (IALD)	Section 130.1 (a) Exception & 130.1 (c) Exception: The language for continuously illuminated egress pathways in these sections are conflicting. The first lists 0.2 watts per square foot while the second lists 0.1 watts per square foot. We would support the use of 0.1 watts per square foot to limit the amount of light remaining on when buildings/spaces are unoccupied.	Staff finds that the initial reasoning behind the differing limits is that up to 0.2 watts per square foot of egress lighting may go without manual area controls, but would still benefit from automatic partial-off behavior to reduce its power use. Thus, the 0.1 watt/sqft threshold for the exception to shutoff control requirements is intended to be roughly equivalent to what is achieved by 50% dimming of 0.2 watt/sqft lighting. Staff therefore finds that the noted differing thresholds are appropriate. (Staff will consider realigning these thresholds in the 2022 rulemaking, where a more complete exploration of their rationale can be made.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222831	Michael Lindsey (IALD)	Section 130.3 – Sign Lighting Controls: We recognize and agree with the requirement for dimming by a minimum of 65% for all Outdoor signs ON during both Day & Night however would also extend the language to cover signs located on the interior of the building that present themselves to the exterior through glazing. 130.3,a,2,B notes that the requirement is only for signs that are illuminated during the day and evening. We have found in practice that there are many signs only on during the evening that are far too bright and need the adjustment in the field to reduce their impact and glare to surrounding neighborhoods. 130.3(a)2B	Staff finds that extending this requirement to include outwardly-faced internal lighting would be likely to incur a marginal cost, and would therefore need a cost analysis in order for it to be considered by the Energy Commission. Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222831	Michael Lindsey (IALD)	Section 140.6 (a), 4, B – Additional Power for Tunable White & Warm Dim: We question the reasoning behind a 0.75 factor when applying against allowed LPD. This additional 0.75 factor seems to be driving the market toward that technology and influencing a more expensive solution to owners. We believe this should be removed all together ensuring the most energy savings while adhering to the energy code standard. If the language remains, note that 5000K is incorrectly noted as 500K in item ii.	1. The adjusted indoor lighting power is provided as the CASE measure analysis shows that small aperture color-tuning luminaires, as well as dim-to-warm luminaires products use more power than similar static color luminaires. The CASE analysis is of limited scope to review small-aperture tunable-white and dim-to-warm luminaires only, and the proposed proposed "adjusted indoor lighting power" only cover small-aperture tunable-white and dim-to-warm luminaires. 2. 500K in item ii is correct as tunable luminaires are capable of changing the CCT value, unlike fixted CCT luminaires.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222831	Michael Lindsey (IALD)	Section 150 (k), 2, H: The removal of this language inhibits the ability to achieve compliance without extensive remodel. In looking at the language removal, we don't believe it to be a cost neutral removal and would end up costing homeowners money. We request that this NOT be deleted.	Staff finds that there is no removal of the allowance of the use of energy management control system (EMCS): the wording is changed to "control" instead of "dimmer" or "vacancy sensor" in order to merge two otherwise identical provisions and reduce redundancy in the regulatory text. Both "dimmer" and "vacancy sensor" are included by the term "control"; staff therefore does not find that restoring the removed, redundant language would be appropriate, nor is it necessary to address the commenter's concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222831	Michael Lindsey (IALD)	Section 150 (k), 2, I: This requirement feels like carry-over from past standards in which low-efficacy and high-efficacy sources were mixed. Now with all sources being high-efficacy, this added cost is not believed to render actual payback both financially and respective to energy. We request that this requirement be removed.	Staff finds that the commenter misunderstands the provision in this section: this section allows for a multiscene programmable controller that provides dimming to count as a dimmer for compliance with the provisions in Section 150.0(k). Section 150.0(k)2I does not require installation of additional controls, it instead *avoids* installation of a redundant dimmer control where a multiscene control is already providing that function and benefit	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222831	Michael Lindsey (IALD)	Section 150 (k), 2, J: The revised wording seems unnecessary and adds confusion to the requirement. We request that the original wording remain.	Staff finds that the revised wording is necessary to clarify that occupancy sensing products that have manual-on configuration can be used for meeting this requirement, and avoid unnecessarily prohibiting products that also offer an automatic-on function. Without the revised wording, this Section could be read as barring the installation of controls capable of automatic-on behavior, even if they also have a manual-on configuration or option.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222831	3/2/2018
222832	John Broniek (Icynene)	Add Section 150.0(s) Buildinq Air Leakaqe: Mandatory air leakage requirements exist in the 2015 IECC section R402.4 for newly constructed buildings. The requirement specifies that building shall be tested and verified as having an air leakage rate not exceeding three air changes per hour in US Climate Zones 3 through 8. Recommendation: Create section 150.0(s), or other suitable section location, for Building Air Leakage requirement. In section include mandatory air leakage requirements for newly constructed buildings. Specify that all buildings shall be tested and verified as having an air leakage rate not exceeding three air changes per hour.	Staff finds that adopting a new requirement for building air sealing would potentially increase costs, and therefore that a cost analysis would be necessary before the Energy Commission could consider the proposal. For this reason, staff does not find it appropriate to add the suggested section at this time. Staff invites the commenter to submit a complete code change proposal inclusive of all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222832	John Broniek (Icynene)	Air-Distribution and Ventilation Svstem Ducts, Plenums, and Fans. Section 150.0(m)1"B.ii: Unvented attics should be considered as conditioned space when location of duct system is concerned since unvented attic is considered within the building thermal envelope (2016 CRC section 806.5). Recommendation. In section 150.0(m) 1.8.2, provide notation that duct system within unvented attic construction can have minimum installed insulation level of R-4.2.	Staff finds that unvented attics are indirectly conditioned space and therefore do not qualify to take the "ducts located entirely in directly conditioned space" compliance credit; being within the thermal envelope is not the sole criteria for "directly conditioned space", as a space that is not served with conditioned air may still reach a significant temperature differential. For this reason, ducts located in an unvented attic are required to meet the mandatory R-6 or the prescriptive requirement of R-6 or R-8, depending on climate zone, and do not qualify for credit based on completely avoiding sigificant thermal differentials.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222832	John Broniek (Icynene)	Ceilinq and Rafter Roof Insulation. Section 150.0(a) 1: Performance path analysis has indicated that R-22 insulation at the roof level results in a negligible energy cost savings benefit,With the prescriptive below deck roof insulation proposed to be increased to R-19 (Table 150.1-A), setting the mandatory insulation for unvented attics to R-19 would result in a consistent R-value at this insulation area, thereby aiding code enforcement / compliance activities. Recommendation: In section 150.0(a) 1, lower mandatory insulation for unvented attics to R-19 at the roof level.	Staff notes that R-22 was adopted in a prior rulemaking where it was found to be technically feasible and cost effective; staff has not proposed to revisit this value in the 2019 rulemaking. To the extent that the commenter believes that there is sufficient justification that would warrant decreasing energy efficiency requirements, staff invites the commenter to submit a complete code change proposal (inclusive of analysis of energy and environmental effects) for the 2022 rulemaking proceeding. Staff otherwise does not find that reducing this adopted value would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222832	John Broniek (Icynene)	Ceilinq and Rafter Roof Insulation. Section 150.0(a)2.: Gasketing of attic access, for air leakage control, between unvented attic and conditioned space is not necessary since an unvented attic is considered within the building thermal envelope (2016 CRC section 806.5). Gasketing of attic acess adds to construction costs and provides no hygrotherrnal performance benefit for unvented attic construction. Indirect conditioning of the unvented attic hecomes more difficult when gasketing of attic access occurs. Recommendation: In section 150.0(a) 2, provide exception to gasketing of attic access for unvented attic construction.	Staff finds that gaskets for attic accesses are needed for energy efficiency because unvented attics still have sizeable temperature differences in comparison to the directly conditioned space of a building. In addition, if an access door is located in a room with a closeable door the pressure from the air supply will force conditioned air through the ungasketed attic access instead of under the door; conversely, an unvented attic can build up some pressure and force an exchange of unconditioned attic air with conditioned air in the adjoining room. Staff therefore finds that gasketing is appropriate to prevent unwanted air exchange between the attic and the directly conditioned spaces which would otherwise impose a small energy cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222832	John Broniek (Icynene)	Definitions. Section RA3.5.2: Air banier material definitions for open cell and closed cell spray polyurethane foam also exist in 2015 IECC section C402.5.1.2.1 , Icynene considers the definitions in that document to be more representative of the performance characteristics of the noted spray foam materials. Recommendation: In section RA3.5.2, chanEe definition of spray foam materials meeting the air permeance testing performance levels to: 1)Closed cell spray polyurethane foam with a minimum density of 1.5 pcf and a minimum thickness of not less than 1.5 inches; 2) Open cell spray polyurethane foam with a mninimum density of 0.4 to1.5 pcf and a minimum thickness of not less than 4.5 inches	Staff notes that the current values for closed and open cell spary insulation represent the minimal performance level in each product group. This is done for U-values and other theral perfomance values in the standards, consistent with the role of Part 6 as a set of minimum efficiency standards. This approach ensures that all products in a category are equally capable of meeting or exceeding the assumed performance, which maintains product agnosticism and allows the standard to apply to new products as they are developed. In addition, this approach allows for code requirements to remain simple and easy to understand. Staff therefore does not find that establishing separate standards for specific types of foam insulation would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222832	John Broniek (Icynene)	Framed Exterior Above Grade Walls. TABLE 150.1-A: Current U-factor of 0.051 is commonly achieved with R-5 continuous (exterior) insulation and R-19 stud cavity insulation. To meet a U-factor of 0.048, a likely approach, due to cost effectiveness, would be to increase stud cavity insulation to R-21 while maintaining R-5 continuous insulation. There is a negligible energy cost savings benefit to this construction approach. Recommendation: In TABLE '150.1-A, forframed exterior above grade walls, maintain maximum U-factor of 0,051 in climate zones 1 through 5, and I through 16.	Staff finds that a U-factor of 0.048 was shown to be cost-effective in climate zones 1-5 and 8-16; reverting back to R-19 would be contrary to State policies and goals of furthering energy savings by capturing all cost-effective energy saving measures.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018

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222832	John Broniek (Icynene)	Recessed Downliqht Luminaires in Ceitinqs. Section 150.0(k) 1.C. iii: Gasketing or caulking of recessed downlight luminaires, for air leakage control, between unvented attic and conditioned space is not necessary since unvented attic is considered within the building thermal envelope (2016 CRC section 806.5). Gasketing or caulking of recessed downlight luminaires adds to construction costs and provides no hygrothermal performance benefit for unvented attic construction. Indirect conditioning of the unvented attic becomes more difficult when gasketing or caulking of recessed downlight luminaires occurs. Recommendation: ln section 150.0(k) 1,C. iii, provide exception to gasketing or caulking of recessed downlight luminaires for unvented attic construction.	Staff finds that the same pressure effects and air exchange noted for attic access apply to recessed downlight luminaires. That is, staff finds that gaskets for recessed downlight luminaires below an unvented attic are needed for energy efficiency because unvented attics still have sizeable temperature differences in comparison to the directly conditioned space of a building. In addition, if the downlights are located in a room with a closeable door the pressure from the air supply will force conditioned air through the ungasketed downlights instead of under the door; conversely, an unvented attic can build up some pressure and force an exchange of unconditioned attic air with conditioned air via the ungasketed downlights. Staff therefore finds that gasketing is appropriate to prevent unwanted air exchange between the attic and the directly conditioned spaces which would otherwise impose a small energy cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222832	John Broniek (Icynene)	RooflCeilinss RA3.5.6.3 (g): In unvented attic construction it is common practice that the insulation is not in contact with recessed light fixtures since insulation is installed at the roof level and recessed light fixtures are at the ceiling level. This situation makes clearance and airtightness requirements for such fixtures unnecessary. Gasketing or caulking of recessed light fixtures luminaires adds to construction costs and provides no hygrothermal performance benefit for unvented attic construction. Indirect conditioning of the unvented attic becomes more difficult when gasketing or caulking of recessed light fixtures occurs. Recommendation: ln RA3.5.6.3 (g), provide exception to all requirements for unvented attic construction.	Staff finds that the same pressure effects and air exchange noted for attic access apply to recessed downlight luminaires. That is, staff finds that gaskets for recessed downlight luminaires below an unvented attic are needed for energy efficiency because unvented attics still have sizeable temperature differences in comparison to the directly conditioned space of a building. In addition, if the downlights are located in a room with a closeable door the pressure from the air supply will force conditioned air through the ungasketed downlights instead of under the door; conversely, an unvented attic can build up some pressure and force an exchange of unconditioned attic air with conditioned air via the ungasketed downlights. Staff therefore finds that gasketing is appropriate to prevent unwanted air exchange between the attic and the directly conditioned spaces which would otherwise impose a small energy cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222832	3/2/2018
222835	Michael Wolf (Greenheck Group)	These comments are submitted by the Greenheck Group in response to the Staff Supplement to CASE Report #2019-NR-MECH3-F by RJ Wichert submitted to the Subject Docket on January 19, 2018. Greenheck strongly encourages the CEC to reconsider the Staff decision to remove the requirement for AMCA 260 licensed seal for induced flow high plume dilution blowers. AMCA 260 licensed fans assure consumers that induced flow high perfoproduct performance at an economical price. As such, CEC Title 24 should retain the requirement for AMCA 260 licensed performance on induced flow high plume dilution blowers.	Staff finds that the marginal cost for an AMCA Certified fan was not expressly considered in the cost effectiveness analysis presented in the documents relied upon for the proposed standards for laboratory fume hoods, and therefore the costs and benefits not specifically analyzed in a way that would allow for consideration of this additional requirement. (Staff was able to confirm with the authors of the proposal that AMCA certified fans were used for the study, however because these costs were not broken out neither staff nor the public had the opportunity to consider whether the costs of certification were commensurate with its benefit and whether the embedded costs for these fans were appropriate proxies for fans generally. Staff can, with additional and specific cost data, consider certification requirements as a part of the 2022 rulemaking.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222835	3/2/2018
222839	Arnold Wilkins	Comment replaced by updated verion TN 222899.	Staff finds that NEMA 77 does not address phantom array effect created by TLA on human health.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222839	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	AHRI supports California adopting ANSI/ASHRAE/IES Standard 90.1-2016 -- Energy Standard for Buildings Except Low-Rise Residential Buildings (ASHRAE 90.1) content in a consistent and harmonized manner. While it is understood that ASHRAE 90.1 was developed to suit the nation, reviewing the measures suitable for California, or adapting measures to better suit California's climate zones is logical and appropriate, but to propose significant deviations from proposals developed through ASHRAE's consensus-building process under the umbrella of "ASHRAE 90.1-2016 proposals" is misleading. During the course of the development of Title 24-2019, several proposals have strayed far from the intent of the ASHRAE 90.1 measures and, if implemented, would negatively impact manufacturers of HVAC equipment by requiring multiple product design requirements to be implemented in different states.	Staff appreciates the comment of support for proposed aligning language with ASHRAE 90.1. Staff notes that the areas of difference are supported by material in the rulemaking record; without making a specific finding of what the commenter would consider "significant", staff finds that existing, readily available equipment currently on the market complies with the proposed filtration and airflow standards. Staff therefore does not find that these requirements necessarily create a need for additional product designs relative to current product offerings.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	AHRI supports CEC's proposal to provide a limited compliance credit to battery energy storage systems that will provide energy design rating points of credit toward the energy efficiency target score.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	AHRI supports consolidating demand response (DR) requirements into a single section.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	AHRI supports limiting the requirement for MERV 13 for outdoor air filtration only to areas that have high ambient PM2.5: near busy roadways. For the remainder of the state the existing requirement for MERV 6 filtration on outside air is sufficient.	Staff finds that most of the State experiences unhealthful levels of particulate air pollutants at some time during the year, and with increasing population, changing climates and increasing disasters (e.g., wildfires), it is not possible to conclusively predict where exceedances will occur or where subsequent construction (of buildings or roadways) will increase local emissions / traffic conjestion or impact local air quality. A uniform statewide requirement provides equal protection to all citizens in newly constructed buildings, makes implementation and enforcement easier, and future-proofs construction for the 30-year time horizon typically considered for low-rise residential buildings. A uniform standard is also source-agnostic, recognizing that while vehicle traffic is a significant source of particulate air pollution, many other sources exist. Staff further notes that higher MERV ratings also mean increased efficacy at filtering larger particulates such as PM10, where the state is almost universally in nonattainment status. Staff additionally finds that the testimony and materials provided by the California Air Resources Board to this rulemaking record speak to a general need for effective filtration of PM2.5 particulates, which are not captured at all by MERV 6 filters. Staff therefore does not find that limiting filtration requirements based on existing busy roadways would be appropriate, as staff finds that the ability to use higher MERV filters is beneficial in all areas.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Air Classification and Recirculation Limitations, Section 120.1(g): The new proposed section for air classification and recirculation limitations is missing a crucial component from ASHRAE Standard 62.1 – allowances for energy recovery ventilation devices (ERV). Sections 5.16.3.2.5 and 5.16.3.3.2 each contain exceptions to permit the installation of ERVs. (see lagnguage page 13) AHRI urges CEC to adopt the above exceptions at the same levels at ASHRAE Standard 62.1.	Staff has added exceptions for energy recovery devices, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Air Filter Efficiency, Section 120.1(b)1.C: AHRI recommends making it clear, that any MERV 13 filter requirement is limited to (1) nonresidential structures with a close proximity to busy roadways; and (2) fans which bring in outdoor air in commercial applications (economizers).	Staff finds that most of the State experiences unhealthful levels of particles at some time during the year, and with increasing population, changing climates and increasing disasters (e.g., wildfires), it is not possible to conclusively predict where exceedances will occur or where subsequent construction (of buildings or roadways) will increase local emissions / traffic conjestion or impact local air quality. A uniform statewide requirement provides equal protection to all citizens in newly constructed buildings, make implementation and enforcement easier, and future-proof construction for the 30-year time horizon typically considered for low-rise residential buildings. Staff additionally notes that higher MERV ratings mean increased efficacy at filtering larger particulates such as PM10, where the state is almost universally in nonattainment status. Staff therefore does not find that limiting filtration requirements based on existing busy roadways would be appropriate, as staff finds that the ability to use higher MERV filters is beneficial in all areas. Staff understands that use of MERV 13 filters would not cause the equipment failures or prevent compliance with the 0.45 w/cfm fan efficacy requirements as claimed by this commenter. ref: Staff Analysis of Air Filter Pressure Drop and Air Filter Sizing (April 2018). https://efiling.energy.ca.gov/getdocument.aspx?tn=223260. Ref: Walker, I. S., Dickerhoff, D., Faulkner, D., & Turner, W. J. N. (2013) System Effects of High Efficiency Filters in Homes. LBNL-6144E; Walker, I. S., Dickerhoff, D., Faulkner, D., & Turner, W. J. N. (2012). Energy Implications of In-Line Filtration in California. CEC-500-2013-081. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Research by Laurence Berkely National Laboratory and California Air Resources Board has determined that MERV 13 filtration should be used on both outdoor air supply and on the return/recirculated airflow in space conditoning systems to eliminate the particulate contamination that enters the dwelling from outdoors or is generated from sources inside the dwelling such as by kitchen cooking activities. MERV 13 is required by Section 150.0(m) 12 in order to safeguard public health. Ref: Singer B, Delp W, Black D, Destaillats H, Walker I. Reducing In-Home Exposure to Air Pollution. 2016. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Air Filter Efficiency, Section 120.1(b)1.C: Analysis performed for some nonresidential HVAC measures assumes a MERV 9 filter in the CEC technical analysis; however, this is not consistent with the CEC's indoor air quality proposal for areas exceeding the 2.5 micron (PM2.5) threshold, where MERV 13 filters are being proposed for nonresidential buildings. AHRI would also like CEC to provide additional information regarding the extent of these PM 2.5 nonattainment areas which would require enhanced filtration, perhaps by releasing zip codes of affected areas.	Staff notes that the Express Terms do not propose to limit filtration devices to specific areas in part because nonattainment areas change over time: seasonal effects, natural disasters such as fires, and construction of new buildings and roadways that increase traffic flow can all cause future needs for higher levels of filtration; staff does not find value in attempting to forecast air quality over a thirty or more year time horizon except to note that increasing population and climate change are both causing a general worsening of air quality statewide, leading to a general statewide risk of IAQ issues. For this reason, staff does not find that additional information about nonattainment areas beyond what is present in the rulemaking record is necessary for consideration of the proposed amendments.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Air Filter Efficiency, Section 120.1(b)1.C: It also appears that CEC has not reviewed the impact of the MERV 13 proposal on all equipment and building types. Package terminal air conditioners and heat pumps (PTAC/PTHP) and single package vertical units (SPVU) are frequently applied in hotels and motels, but due to the space-constrained nature of these products, neither are able to accommodate a two-inch deep MERV 13 filter. Even a one-inch deep MERV 13 filter would seriously reduce the airflow, which would adversely impact both energy efficiency and occupant comfort, as well as make equipment noisier. AHRI recommends exempting equipment which brings in outdoor air associated with any make-up air units with a maximum airflow threshold of 120 cfm in Section 120.1(c).	Staff finds that pressure drop characteristics of air filters vary widely, and are not directly dependent on MERV ratings in the MERV 6 to13 range. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone. Filters of any MERV rating must be sized correctly in order to ensure filtration does not adversely affect the performance of an HVAC system. This highlights the need for air filter labeling, which California has addressed by requiring filter labeling. https://efiling.energy.ca.gov/getdocument.aspx?tn=223260 Staff therefore does not find that the exceptions suggested by the commenter are necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Air Filter Efficiency, Section 120.1(b)1.C: The same concerns expressed regarding residential IAQ proposals on MERV 13 and the two-inch filter depth requirement apply to nonresidential applications. The two inch filter depth requirement should be eliminated in favor of a pressure drop related measure.	Staff finds that pressure drop characteristics of air filters vary widely, and are not directly dependent on MERV ratings in the MERV 6 to13 range. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone. Filters of any MERV rating must be sized correctly in order to ensure filtration does not adversely affect the performance of an HVAC system. This highlights the need for air filter labeling, which California has addressed by requiring filter labeling. https://efiling.energy.ca.gov/getdocument.aspx?tn=223260 That said, staff has added 1-inch depth filter alternative to the two-inch depth filter in 120.1(b)1Bii that is based on 150 ft/min face velocity and 0.1 inch w.c. pressure drop, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Cooling Tower Efficiency, Mandatory Requirement, Section 140.4(h)5: While it would be preferable for CEC to harmonize completely with ASHRAE 90.1, AHRI does appreciate that the proposed language in the Express Terms is a significant improvement to the previous proposal.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	During the February 5th Public Hearing, CEC indicated that OpenADR 2.0 is required, but that other communication protocols are also allowed; however, with the OpenADR requirement to the end node, it appears in practice that other communication protocols would not be permitted.	Staff has clarified the language in Section 110.12(a) regarding use of additional protocols, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Exhaust Air Heat Recovery, Pre-publication Draft Section 140.4 (o): AHRI appreciates CEC's reconsideration of previously proposed language related to exhaust air heat recovery which is now absent in the Express Terms. Should CEC seek to reintroduce this measure in the future, AHRI suggests net sensible energy recovery ratio of at least 50-percent for both heating and cooling for DOAS only.	Staff will retain this comment for any future consideration of of the noted measure, per the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): AHRI continues to urge CEC to review portions of the collected data to determine the fan efficacy values being recorded today rather than relying on measurements taken on duct work conducted in a laboratory setting.	Staff finds that results from installing contractor and HERS Rater field verifications submitted to the HERS Provider Data Registries are not as reliable as the data generated by properly organized field or laboratory research, due in part to the uncertainty of the quality and calibration of the field diagnostic tools used by installation contractors and HERS raters and the uncertainty of the quality of the field diagnostic practices employed by these installers and Raters. Investigations of system performance conducted by reliable field survey and laboratory research organizations is necessary for justifying proposed regulations. Staff also notes that systems that were not required to be designed to the proposed standard may not have been designed to that standard for reasons unrelated to ease or cost, noting that the standard is directly related to a new federal standard for equipment efficiency that is not yet effective.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): AHRI does appreciate that CEC is proposing that 0.45 Watts/cfm requirement will be applicable only to furnaces and that the existing 0.58 Watts/cfm requirement will remain in effect for air handling units that are not furnaces.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): CEC should maintain the existing 0.58 Watt/cfm requirement on all furnaces manufactured prior to July 3, 2019.	Staff has added an exception for gas furnace air-handling units to align to the federal effective date, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): No testing was performed on furnaces with PSC motors, and there is no indication that these existing, federally compliant products will be able to meet proposed requirements, further falling afoul of federal preemption.	The new Federal regulations for minimum furnace fan efficiency will require furnace fans to provide minimum efficiency equivalent to the constant torque brushless permanent magnet (BPM) type motors used in multi staged furnaces. This means that in 2019 the minimum efficiency furnace fan will become more efficient than the 2006 standard furnace fan, for which permanent split capacitor (PSC) type fan motors were typical. Laboratory testing was performed to determine whether BPM blower motors in a representative sample of non-weatherized furnaces are capable of delivering at least 350 cfm/ton of air using 0.45 W/cfm or less. This was accomplished by testing each fan's performance at different speed settings and outlet static pressures, in order to create performance curves for each fan. All of the tested furnace fans were able to demonstrate compliance with the proposed fan efficacy limit of 0.45 W/cfm, while still producing at least 350W/cfm airflow at the typical rated cooling speed static pressure of 0.5 IWC. All of the tested furnaces were also compliant with the proposed Title 24 requirements when evaluated on a system curve corresponding to the Federal test procedure for the 2019 furnace fan efficacy requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): The Energy Policy and Conservation Act plainly states "effective on the effective date of an energy conservation standard established in or prescribed under section 6295 of this title for any covered product, no State regulation concerning the energy efficiency, energy use, or water use of such covered product shall be effective." 42 U.S.C 6297(c). This prohibition is broadly written to apply not only to efficiency minimums, but labeling requirements, effective dates, and installation penalties. CEC has not received a waiver from the Department of Energy for its proposal, and none of the other narrow preemption exemptions apply.	Staff notes that 42 U.S.C. section 6297(c) applies to state regulations that set standards concerning energy efficiency, energy use, or water use of covered products, but does not apply to labeling requirements. Nevertheless, staff has added an exception for gas furnace air-handling units to align to the federal effective date, consistent with the commenter's suggestion. Staff finds that this resolves the noted concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): The proposal is also fatally flawed because of the stranded inventory it would create. The compliance date for the federal furnace fan rule is July 3, 2019, while the 2019 edition of Title 24 will go into effect shortly thereafter on January 1, 2020. This means new construction builders will have only five months to switch to gas furnaces with higher efficiency motors. Because the federal furnace fan standard is based on the date of manufacture, the fan efficacy requirement should be based on the date of manufacture as well. A proposal ignoring the date of manufacture would not only be arbitrary and capricious but it would be pre-empted by federal law. 42 U.S.C. § 6297; 42 U.S.C. § 6316(b)(2)(A).	Staff has added an exception for gas furnace air-handling units to align to the federal effective date, consistent with the commenter's suggestion. Staff finds that this resolves the noted concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): The test report also fails to address previously raised concerns (during the July 18th meeting and in previous AHRI comments) that for this particular measure, the field tests were not conducted with MERV 13 filters. AHRI suggests that CEC show through this testing that an increased MERV requirement would not adversely impact energy consumption.	Staff finds that filter sizing is only one aspect of duct system design. The effect of the quality of the duct system design, including the effects of cooling coils, results in static pressure resistance to flow. The laboratory testing described in the Proctor Engineering Furnace Blower Testing report was conducted at a range of static pressures that would be consistent with a reasonably well designed duct system; the filters used for that test provided a pressure drop that would be representative of the pressure drop from filtration encountered in the field. There is no basis for expecting the furnace fan testing results to be different if MERV 13 filters were included in the laboratory test setup given the data in the record showing a lack of correlation between MERV rating and pressure drop within the MERV 6-13 range. Staff therefore does not find that additional testing is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): While it is important to ensure proper duct construction, there is no way to verify that Manual D is being complied with during the construction process, and manufacturers of HVAC equipment should not be held responsible for duct design and construction.	Staff notes that field studies conducted by Proctor, et al made recommendations for return duct sizing that have been incorporated in Standards Tables 150.0-B and C as of the 2013 update to Title 24, Part 6; compliance with these duct design tables is an alternative to performing a fan efficacy field verification. Installed duct systems can be visually verified for conformance with Tables 150.0-B and C. Staff does not find that these requirements have the effect of making equipment manufacturers responsible for duct design and construction. Ref: Proctor, John, Rick Chitwood, Bruce A. Wilcox. (Proctor Engineering Group, Ltd., Chitwood Energy Management, Inc. Bruce A. Wilcox). 2011. Efficiency Characteristics and Opportunities of New California Homes. California Energy Commission. http://www.energy.ca.gov/2012publications/CEC-500-2012-062/CEC-500-2012-062.pdf	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.0(m): Without any validation testing, AHRI strongly urges CEC to provide an exemption for packaged or mobile home products. AHRI supports product improvements that make advancements in efficiency; however, these should not be mandated across all product lines without an adequate body of corresponding test data in each category. Doing so will cause market disruption which will disproportionately affect some manufacturers more than others.	Staff notes that Title 24, Part 6 does not regulate mobile home HVAC products. Regarding Packaged HVAC units, staff understands that there is no technological difference in the fans and motors used in packaged vs. split systems, and there is virtually no difference in FER requirements between the highest FER split system furnaces and packaged systems. Staff therefore finds there is no basis to assume that packaged systems might be incapable of meeting the proposed 0.45 w/cfm requirement when laboratory research has demonstrated that split systems are capable of meeting this 0.45 w/cfm requirement. ref: Proctor Engineering Group, 2017. Residential Furnace Blower Performance Testing. https://efiling.energy.ca.gov/getdocument.aspx?tn=222296	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan Efficacy, Section 150.1(c)10: AHRI suggests that changes proposed in this letter for Section 150.0(m) should also be implemented in Section 150.1(c) for consistency in the standard.	Staff has edited Section 150.1(c)10 to incorporate an exception for gas furnace air-handling units manufactured prior to July 3, 2019 to comply with a fan efficacy value less than or equal to 0.58 w/cfm as confirmed by field verification and diagnostic testing in accordance with the procedures given in Reference Residential Appendix RA3.3, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Fan System Power, Section 140.4(c): AHRI supports updating the fan allowances to be aligned with ASHRAE 90.1, with the only exception being modification for California climate conditions. It should be noted that, during the July workshop, CEC stated that the base case in the CEC technical document assumes a MERV 9 filter; however, this is not consistent with the CEC's indoor air quality proposal for areas exceeding the 2.5 micron (PM2.5) threshold, where MERV 13 filters are being proposed for nonresidential buildings. Despite AHRI's urging, CEC did not update the model to show the energy impact the fan system power with the proposed air-filter level of MERV 13.	Staff notes that the research in the rulemaking record shows that MERV and pressure drop are not correlated between values of 9 and 13; staff therefore finds that the difference in MERV assumptions in the noted technical document is immaterial in relation to anticipated energy use, and that no update to the model is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Filter Depth, Section 120.1(c)1.B: The ISOR clearly states that, "2-inch depth filters for improved filter airflow, otherwise allow for 1-inch depth filters if 0.1 inch w.c. pressure drop and 150 ft per minute face velocity for the filter is used for the design;" however, the one-inch option seems to have been inadvertently left out of Section 120.1(c)1B. AHRI recommends including the option for one-inch deep filters in this section.	Staff has added this option to the Express Terms, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Heating Capacity at 17 °F, Section 150.1(b)3.B.iv and v: The proposal imposes verification requirements beyond federal requirements for heat pumps with greater than minimum heating performance (HSPF), specifically heating capacity values at 17 degrees Fahrenheit, as an option for performance compliance. With certain exceptions, which do not apply in this case, 42 U.S.C. § 6297 prohibits state regulations from requiring disclosure of information with respect to the energy use, energy efficiency, or water use of any covered product. And the proposal, which bans federally compliant products unless they comply with these excessive requirements is thus pre-empted by federal law for this reason as well. CEC could make this an optional, but not a required field.	The procedure for verification of hea pump capacity at 17 degrees F specified in Residential Appendix RA3.4.4.2 has been clarified to specify that "If the product directory does not publish capacity ratings at 17F, then compliance with capacity at 17F is not required." Thus, this information is not required: if this information is included in the AHRI listing used to verify rated heating capacity at 47 degress F then the HERS Rater is directed to also verify this value.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Minimum Airflow Requirements: Certified capacity and airflow rates are publicly available on the AHRI Certification Directory. Just as CEC has proposed using the AHRI Certification Directory for heat pump capacity at 17 °F, inspectors are easily able to find rated capacity and airflow rates. CEC should allow airflow rates that are utilized to achieve federally mandated minimum efficiency performance	Staff finds that compliance with minimum airflow requirements by use of values based on nominal tons is consistent with the industry's use of nominal component sizes in their product lines, and is easily enforced as it is possible to know the manufacturer's nominal airflow rate based on building conditioning loads without referring to specific manufacturer documentation or ratings. It would not be reasonable to structure a system airflow rate compliance procedure based on manufacturers system rated capacity since the system manufacturer and model information and exact sizing is rarely known at the time the certificate of compliance is completed (i.e. when only rough architectural plans are available to an energy consultant, and there is no HVAC design available). Indeed, it is common that HVAC designs are not performed prior to installation in residences. Thus, staff finds that use of rated capacity would needlessly complicate the compliance process as it would force revisions of the certificate of compliance for virtually all projects at the point in the process just after the system was selected, but before it was installed. Staff is not aware of any benefit that would result from this proposal, and therefore does not find that adding this allowance would be appropriate. Staff notes that 350 cfm/ton was determined by research as a minimum value necessary to limit degradation to cooling system efficiency; an airflow rate based on rated capacity would not be compatible with the purpose of the 350 cfm/ton minimum airflow rate requirement (300 cfm/ton for altered systems).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Natural Ventilation Procedure, Section 120.1(c)2: AHRI would like the CEC to be aware of draft modifications to the Natural Ventilation Procedure of ASHRAE 62.1-2016, which are expected to be released for public review shortly. The 62.1 committee has already voted to issue the draft addendum for public review. AHRI suggests CEC review the draft addendum, upon publication, and consider adopting similar provisions into Title 24 upon incorporation in ASHRAE Standard 62.1.	Staff finds that the publication of the final addendum will not occur in time for lawful consideration by the public and the Energy Commission within this proceeding, and does not find that aligning with draft language that is subject to change would be appropriate. Staff can include review and consideration of this language in the upcoming 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Open source communication to a manufacturer's cloud would not impede CEC's desire to implement simple approaches to scale DR. AHRI suggests that CEC include language clearly permitting open source communication to a manufacturer's cloud to ensure robust competition in the DR marketplace.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Pipe Insulation, Section 120.3(a): AHRI also appreciates CEC retaining Exception 4 to Section 120.3, "Where the heat gain or heat loss to or from piping without insulation will not increase building source energy use."	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Pipe Insulation, Section 120.3(a): AHRI appreciates CEC responding to the AHRI concerns submitted in previous comments by clarifying that the general requirements for pipe insulation in Section 120.3(a) are for normal operating conditions.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Proposal for Tables 120.6.B & 120.6.C: The CEC has proposed acceptance testing in dry mode only using an air-cooled condenser test standard. As these units are designed for wet operation, which is where they save the maximum energy, we suggest that adiabatic condensers be tested in the wet (adiabatic) mode. Alternatively, if the CEC desires to not make this modification to the 45-day language, and call for adiabatic condensers to be tested in the dry mode, then the language should clearly state that the adiabatic pads should be removed during dry mode testing. This will place adiabatic designs more on par with air-cooled condensers.	Staff finds that "worst case" testing of these units in dry mode and with pads in place is appropriate given that they will be operated in dry mode during a significant fraction of the year, and that operators are unlikely to remove the pads when operating the equipment in dry mode.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Proposal for Tables 120.6.B & 120.6.C: Use 95 °F Saturated Condensing Temperature (SCT), 95°F Outdoor Dry-bulb Temperature, 70 °F Outdoor Wet-bulb Temperature for thermal rating condition for adiabatic condensers. AHRI proposes establishing minimum sizing criteria for the equipment based on adiabatic (wet) operating conditions, with the saturated condensing temperature at or below the ambient dry bulb temperature.	Staff finds that the equipment must be sized such that it can provide all needed capacity while operated in the dry mode, given that it will need to be operated exclusively in this mode for some fraction of the year. Staff does not find that amending the language to permit equipment that will be undersized when operated in its dry mode to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Rated Heat Pump Capacity Verification, RA 3.4.4.2: Should CEC make the specified heating capacity values of heat pumps at 17 degrees Fahrenheit optional, rather than required, AHRI supports the use of the AHRI Certification Directory for the visual verification of heat pump capacity at 47°F and 17°F should inspectors need to confirm this information, as presented at the July 18th meeting.	Staff has revised the language in this Section to state that this capacity value is not required and is only verified when it is available in the AHRI product listing, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Replacement Water Heater Requirements, Section 150.2(b)1.H: AHRI has the same concerns as discussed in Sections 150.1(c)8.A.iii and iv above and urges CEC to decouple the water heater from the photovoltaic requirements.	Staff does not find that the PV requirement violates federal preemption, however staff has modified Section 150.2(b)1H based on public commentary to remove requirements relating to PV and instead require installation of rigid insulation below the water heater and for the water heater to have a specified communication capability, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Requirements for Ventilation and IAQ, Section 120.1: CEC should reconsider divergence and instead completely harmonize with ASHRAE 62.1.	Staff finds that the amendments proposed relating to incorporation by reference of ASHRAE 62.1 are appropriate for the reasons stated in the rulemaking record.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Service Water Heating Systems, Prescriptive Requirements, Section 140.5: AHRI is concerned with the change in requirements for service water heating systems to comply with the solar fraction requirement of Section 150.1(c)8.B.iii. In the current edition of Title 24, buildings four stories and greater are not required to comply with the solar fraction requirement; however, CEC is now proposing to increase the exemption to buildings of eight stories or greater. During the February 6 public hearing, CEC staff was unable to provide a data-driven reason for this change, and no detailed proposal are contained in the CASE reports. In light of this lack of proof to substantiate the change, AHRI recommends retaining the current exemption of four stories or greater.	Staff notes that the comment is incorrect in stating that the "current edition of Title 24" has a exception to solar fraction requirements for buildings greater than 4 stories; the 2016 Standards do not have any exception for solar fraction requirement. The version the commenter refered to was a pre-rulemaking draft of the 2019 Express Terms, and as stated in the October 5, 2017 workshop the pre-rulemaking language was a working draft and the number of stories in the proposed exception might change. The exception noted by the commenter has been removed by staff based on other public comments asserting that the specific number of floors had not been fully justified within the rulemaking record. Staff does not find that retaining the exception (at either noted number of floors) would be appropriately responsive to these concerns.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	The last sentence of the Initial Statement of Reason (ISOR) incorrectly states, “Therefore, these proposed regulations do not duplicate or conflict with any federal regulations.” In truth, there are several proposals which CEC must change because they are plainly preempted under the Energy Policy and Conservation Act of 1975 (EPCA), 42 U.S.C. § 6297. Moreover, failing to make these changes will jeopardizes not only the specific offending proposals but others as well, since it is not clear that pre-empted proposals can be severed from others.	Staff does not find that the standards violate preemption in the manner described in the commenter's comment letter, for the reasons stated above.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222840	Laura Petrillo-Groh (AHRI)	Thermal Storage Equipment: We urge CEC to make a similar credit available to thermal storage systems, including grid-connected flexible electric heating and cooling (including ice thermal storage), when they are controlled similarly to the control schemes prescribed for battery storage. Credit for energy storage should be technology neutral and performance-based.	Staff notes that this comment relates to compliance modeling software and not to the proposed changes to regulatory text that are a part of the rulemaking proceeding. Staff will include modeling of additional storage and demand flexibility options (and associated energy benefits/credits) as a part of updating its compliance modeling software. (Staff notes that performance-based credit will be lower for thermal storage than for battery storage as the loads that thermal storage is capable of addressing represent only a subset of the loads that electricity storage is capable of addressing.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Transfer Air for Exhaust Air Makeup, Section 140.4(o): AHRI appreciates CEC responding to previous AHRI comments and modifying this proposal to harmonize with ASHRAE Standard 62.1 regarding pressurization. However, one important point is necessary for complete harmonization. ASHRAE 62.1-2016 limits the recirculation of lower quality air into spaces that contain air of higher quality. AHRI urges CEC to include a similar provision to ensure the highest degree of indoor air quality possible while reducing the overall energy consumption of the building.	Staff notes that Section 120.1(g) sets these limits and is fully aligned with ASHRAE 62.1, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Transfer Air for Exhaust Air Makeup, Section 140.4(o): AHRI supports the proposal to use transfer air to supplement air to spaces that exhaust more than the amount of conditioned air required.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Water Heating Prescriptive Requirements, Sections 150.1(c)8.A.ii, iii and iv: AHRI urges CEC to maintain parity with the performance path, as well as federal law, and allow an option for gas or propane storage type water heaters with an input of 105,000 Btu per hour or less, rated volume of more than 55 gallons to remain.	Staff amended the threshold btu/hr values to align with current federal law: staff finds that a threshold value of 75,000 Btu/hr is consistent with the current federal definition of "gas fired storage water heater", and that the 105,000 Btu/hr threshold is now specific to oil (rather than gas) water heaters (and thus no longer appropriate to apply to gas or propane water heaters). Separately, and in regards to gallon capacity, staff notes that the Express Terms does not propose to remove the option applicable to gas water heaters greater than 55 gallons in size. Staff has added an option for gas water heaters of 55 gallons or less to ensure that all sizes of gas fired storage water heaters (as federally defined) have an associated prescriptive option, which appears to be consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Water Heating Prescriptive Requirements, Sections 150.1(c)8.A.ii, iii and iv: CEC's proposal in Sections 150.1(c)8.A.iii and iv, which requires the installation of solar panels when a heat pump water heater is installed, is also clearly preempted - regardless of the efficiency of the product. With certain exceptions, which do not apply in this case, 42 U.S.C. § 6297(f) prohibits a regulation or other requirement contained in a State or local building code for new construction concerning the energy efficiency or energy use of a covered product. Linking the installation of heat pump water heaters and solar panels speaks directly to the energy use of the product. It would ban a federally compliant product by imposing a penalty through the code. AHRI urges CEC to decouple the water heater from the photovoltaic requirements.	Staff does not find that the proposed prescriptive standard is prohibited under 42 U.S.C. § 6297(f), noting that compliance based on meeting an energy consumption objective is provided by the performance compliance approach. That said, staff revised the prescriptive compliance options for heat pump water heaters and removed the option that specified installation of additional solar photovoltaic capacity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Water Heating Prescriptive Requirements, Sections 150.1(c)8.A.ii, iii and iv: The banning of gas or propane storage type water heaters with an input of 105,000 Btu per hour or less, rated volume of more than 55 gallons is clearly preempted under 42 U.S.C. § 6297. This proposal would also ban a federally compliant product which is clearly prohibited under EPCA.	Staff does not find that the PV requirement violates federal preemption, however staff has modified this option based on public commentary to remove PV and instead require the installation of a rigid insulation below the water heater and a communication capability, consistent with the commenter's suggestion. Staff separately notes that gas and propane water heaters with an input above the federal threshold (75,000 Btu/hour) for non-instantaneous water heaters are not banned: while there is not an option for prescriptive installation of this equipment, it can be installed under the performance compliance approach.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018

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222840	Laura Petrillo-Groh (AHRI)	Water Heating Prescriptive Requirements, Sections 150.1(c)8.A.ii, iii and iv: The ISOR explains that the option for storage water heaters less than or equal to 55 gallons is being deleted because Quality Insulation Installation (QII) is now a requirement for all new low-rise buildings. The ISOR also claims that all the rescriptive options must be equivalent; however this has not been demonstrated for the water heater options, particularly now that these products are rated based on the amount of hot water they can provide (i.e. usage bins).	Staff finds that the commenter misunderstands the explanation of the chage in the ISOR: "equivalent" in this context means equivalent in their effect on the total energy consumption of the building, based on performance modeling. Staff finds that the performance modeling software used by staff to develop the prescriptive options is fully able to model equipment of different rated sizes and efficiencies. Staff also finds that staff's use of this software to develop additional prescriptive options that meet or exceed the performance target set by the "standard design", as well as to remove prescriptive options that would no longer meet or exceed the performance target set by the "standard design", is consistent with the descriptions provided in the Inital Statement of Reasons. (Staff notes that the prescriptive compliance options do not act to limit installed equipment: equipment that falls outside of the prescriptive options can be installed using the performance compliance approach.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222840	Laura Petrillo-Groh (AHRI)	Waterside Economizers, Section 140.4: AHRI suggests CEC retitle Table 140.4-C to, “Table 140.4-C. Capacity requirements for chilled-water cooling systems without a fan or systems that use induced airflow.”	Staff finds that the suggested title would unnecessarily repeat a specification stated in Section 140.4(e)1, and in doing so make the title excessively long and unwieldly. Staff therefore does not find that amending the title of the table would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222840	3/4/2018
222841	Claire Barnett	Recommendation: Improve proposed regulations regarding school and child care facility retrofits, so that energy retrofits help maximize children's health, thinking and learning.	Staff finds that the Express Terms includes provisions that would result in improvements to indoor air quality, including in the context of school and child care facilities. The commenter is otherwise not specific with regards to which efficiency measures potentially decrease indoor air quality / environmental health or what additional provisions would address any observed effect; as staff does not find that energy efficiency provisions have any general effect of decreasing indoor air quality or environmental health, staff invites the commenter to submit a complete code change proposal, including a description of the effects that create their concern, for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222841	3/4/2018
222841	Claire Barnett	Recommendation: Recommend establishing a broad-based school facility assessment data base in conjunction with CAL Dept. of Education.	Staff finds that the recommended endeavor would fall outside of the scope of the California Building Standards Code generally and the Energy Code in Part 6. Staff has passed the commenter's recommendation to appropriate internal personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222841	3/4/2018
222841	Claire Barnett	Recommendation: Repost updates for public comment.	Staff posted the revised Express Terms on May 9, 2018 for a 15-day public comment period, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222841	3/4/2018
222841	Claire Barnett	Recommendation: Update citations (IOM 2011, Climate, the Indoor Env, and Health; EPA Energy Savings + Health for schools; Schools for Health, 2017, Harvard Chan SPH; NRC, 2006, Green Schools)	Staff has updated references to the documents incorporated by reference into Part 6, consistent with the commenter's suggestion; staff otherwise does not find that referencing documents that are not used within Part 6 would be appropriate. To the extent that the commenter is recommending that additional documents be incorporated by reference, as no description is provided of the effect of doing so staff invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222841	3/4/2018
222842	Kasper Ravn (WindowMaster Inc.)	EXCEPTION 1 to Section 120.1(c)2: Window actuator control strategies such as “Pulsing”, can achieve sufficient air quality but still minimize heat loss. With this strategy, the windows will close and open multiple times per hour to vary the air flow rate and create a dynamic indoor environment without draft problems. However, the current wording of Exception 1 to Section 120.1(c)2 will not allow this well-documented strategy to be employed in buildings in California. (see language page 4-5) It should be noted that the ASHRAE’s SSPC 62.1 Natural Ventilation Working Group is also working on addressing the issue identified here. We recommend that the California Energy Commission discuss the final proposed language for this exception with the ASHRAE Working Group to ensure that there is consistency between the two codes.	Staff finds that as the ASHRAE language is not yet finished it is not appropriate to, at this point, adopt its provisions into Part 6. Instead, staff notes that a compliance option for this approach can be considered following finalization of updated ASHRAE language.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222842	3/3/2018
222842	Kasper Ravn (WindowMaster Inc.)	Natural ventilation is not currently addressed in a comprehensive manner in the performance approach. Currently a commercial building, for example, cannot be modeled for credit in compliance for using window actuators and pulse control strategy in CEBCC-Com. We recommend that the California Energy Commission address this lack of modeling capability in Title-24. This will allow building designers and engineers in California to take advantage of natural ventilation as an energy efficiency strategy for net-zero buildings and develop healthier and more productive indoor environments.	Staff finds that this comment relates to the Energy Commission's building modeling software, and not to the Express Terms. Staff has passed this request on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222842	3/3/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222842	Kasper Ravn (WindowMaster Inc.)	Section 120.1(c)2: It is unclear if the word “permanently open” refers to the “spaces” being permanently open to the “operable wall openings”, or if it refers to “spaces” having permanently open “wall openings”. These can mean two very different things. We believe the intent here is the former and not the latter interpretation. (see language page 5)	Staff finds that, for Section 120.1(c)2B, the requirement that "Spaces or portions of spaces to be naturally ventilated shall be permanently open to operable wall openings directly to the outdoors" means that the space to be naturally ventilated will not be closed off from the operable wall openings that provide the natural ventilation needed by that space. This phrasing accounts for cases where the naturally ventilated space is not directly adjacent to the operable wall opening that is specified as serving it. This is consistent with the commenter's interpretation.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222842	3/3/2018
222843	Keith Lins (M.K. Plastics Corporation)	These comments are submitted by the M.K. Plastics Corporation in response to the Staff Supplement to CASE Report #2019-NR-MECH3-F by RJ Wichert submitted to the Subject Docket on January 19, 2018. M.K. Plastics strongly encourages the CEC to reconsider the Staff decision to remove the requirement in Section 140.9(c)1B for “The exhaust fan system, including fan, nozzle, stack and wind band shall be licensed to bear the AMCA (Certified) ratings seal for air performance (AMCA 210) or AMCA ratings seal for induced flow fan high plume dilution blowers (AMCA 260).”	Staff finds that the marginal cost for an AMCA Certified fan was not expressly considered in the cost effectiveness analysis presented in the documents relied upon for the proposed standards for laboratory fume hoods, and therefore the costs and benefits not specifically analyzed in a way that would allow for consideration of this additional requirement. (Staff was able to confirm with the authors of the proposal that AMCA certified fans were used for the study, however because these costs were not broken out neither staff nor the public had the opportunity to consider whether the costs of certification were commensurate with its benefit and whether the embedded costs for these fans were appropriate proxies for fans generally. Staff can, with additional and specific cost data, consider certification requirements as a part of the 2022 rulemaking.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222843	3/5/2018
222844	John Broniek (Icynene)	Duplicate of TN 222832.	See comment TN# 222832 for responses.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222844	3/2/2018
222845	Dave Bannister (AccurIC)	NEMA 77 (and in particular, its use of SVM) cannot, in our view, be presented as an alternative to carrying out and publishing the results of, the measurements specified in JA10. JA10 measurements provide the measured data, whereas SVM provides one proposed aggregation and interpretation of the data.	Staff is not proposing inclusion of NEMA 77 as a part of this rulemaking, in part due to comments raising concerns with regards to its use. Staff appreciates the comment of support for this decision.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222845	3/5/2018
222845	Dave Bannister (AccurIC)	The publication of data specified in JA10 would not preclude (particularly following a compromise proposal which follows) the subsequent calculation of SVM, as defined within NEMA 77. Whereas, the publication of SVM, as a single metric in place of the measurements specified in JA10 would mean loss of data (through irreversible aggregation). We therefore propose, in the interests of both compromise and full disclosure, that the time-domain data produced by the measurement procedure outlined in JA 10.5, be published, thereby enabling both the SVM metric and the filtered Modulation Depth data, to be calculated for each product. This would simultaneously provide the Commission with the data sought by JA10, as well as enabling standards bodies to make a proper assessment of the relative ease of measurement and utility of currently competing standards in respect of flicker at frequencies above 90Hz.	Staff finds that reporting of raw data files, rather than single-number statistical results, would require a different certification protocol and would not have a meaningful way to be shared with the public. The test specifies that tests are to be conducted at a minimum 20kHz sample rate for a minimum of one second, but does not place an upper bound on observation frequency or duration, meaning that raw observation data is not guaranteed to be similar or comparable between tests. This data would also not be useful to anyone seeking to comply with Part 6 by installing appropriate lighting products; the additional reporting of 400Hz and 1kHz statistical values provides support for the "low risk of effect" and "no effect" level under IEEE PAR1789, as these are roughly the frequencies at which a 30% depth of modulation crosses each of these lines, providing sufficient data for designers to comply with these thresholds as well as with minimum Part 6 compliance. Staff therefore would not be able to justify this additional reporting.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222845	3/5/2018
222845	Dave Bannister (AccurIC)	If, however, the Commission takes the view that such a compromise would involve the storage and retention of too much data, then in light of the above, JA10 data should in our view, be required from all manufacturers.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222845	3/5/2018
222846	Ted Tiffany (Guttmann & Blaevoet)	Controls for systems with natural ventilation 140.4(n): An exception should be applied for single zone mechanical systems for these controls to be interlocked to the HVAC system.	Staff does not find that the availability of natural ventilation changes the need to prevent mechanical conditioning of air at times when natural ventilation is used.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222846	3/5/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

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222846	Ted Tiffany (Guttmann & Blaevoet)	With the regulated occupancies coming into Title-24-2019 language for Healthcare (OSHPD regulated) buildings we want to make sure the following elements of compliance are adequately addressed for this new building sector and plan check agency. a. Most mechanical and electrical requirements are exempt under these newly developed sections and in performance based compliance software these exceptions need to be enabled and allowed in the software. b. Forms must adequately reflect these exceptions as well. c. "I" occupancy ventilation rates for both 100% Outside air and recirculation air systems must adequately be applied in the performance path software. d. Training for OSHPD plan check teams is critical to understand the complexities of the forms and what new exemptions apply for this occupancy type. Again, forms really need to be clear about the exemptions noted.	Staff notes that this comment relates to compliance forms, compliance software, and staff training, and does not relate to the Express Terms. None the less, staff is committed to ensuring that the Energy Commission's compliance documents and software are comprehensively updated to account for the proposed updates to Part 6, and to ensuring that all affected stakeholders are provided with training opportunities. Staff has passed this comment on to appropriate internal personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222846	3/5/2018
222846	Ted Tiffany (Guttmann & Blaevoet)	Lighting for plant growth in section 140.6 (a) 3 item G still exempts cannabis facilities now regulated by CALCannabis. With this newly regulated industry I was hoping to see this occupancy type included in the Standards to regulate HVAC, lighting, and IAQ. With a 3-5% increase expected on the power grid from grow facilities I would expect to see some level of energy efficiency gains in this set of standards relating to this occupancy. Lighting for plant growth should no longer be in the "exempt" lighting section now that this occupancy is in the regulated market.	Staff did not receive a code change proposal relating to standards for indoor agriculture / horticulture areas and equipment as process spaces and loads, and does not otherwise have sufficient information in the record that would allow for establishing standards for these processes (thus making them covered processes rather than exempt processes). Staff invites the commenter to submit a complete code change proposal for 2019.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222846	3/5/2018
222846	Ted Tiffany (Guttmann & Blaevoet)	Regarding Natural Ventilation Sections 120.1 2, I understand this section aligns with current ASHRAE 62.1 language but the Technical Committee is reviewing current language right now to "Fix" both the prescriptive and the "engineered system" language and the opening location and size requirements. CEC should be prepared to adopt these changes mid cycle as they are released in addendum format to align with these corrections.	Staff will review any final, published updates to ASHRAE 62.1 and, if found to be appropriate, will include them in the next subsequent rulemaking proceeding, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222846	3/5/2018
222849	Harold Jepsen (Legrand, North America)	Scheduling control and properly limit the motion control zone should be put back into the standard to uphold energy efficiency and to maintain code stringency. 130.2(c)3	Staff has revised the language of this Section to more closely align with the 2016 requirements (and specifically requirements for isolation and scheduling controls), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222849	3/5/2018
222849	Harold Jepsen (Legrand, North America)	We believe the TN #222626 proposed languge restores outdoor lighting control efficiency and more directly defines the applying requirements for compliance. 130.2(c)	Staff has made substantively similar revisions to those suggested in TN #222626, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222849	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222851	Roger LeBrun (Velux)	There has never been any CASE report I know of that has addressed the cost justification for setting skylight U-factor equal to window U-factor. they did nothing to justify setting the maximum where only very exotic and expensive custom units can comply prescriptively (not even TDDs can comply). This is highly discriminatory, especially considering the high efficacy of skylights for providing the most daylight, ALL day long, of any other fenestration type. And venting skylights are as efficient in moving air as whole house fans, but do not require any power. The Commission would be well served to revisit this topic, and would open up the possibility of more efficient homes with optimal fenestration deployment (due to less total fenestration area being required for daylight).	Staff notes that changes to prescriptive skylight U-factor requirements (found in Tables 140.3-B, C, and D) are not within the scope of the current rulemaking (the proposed change to these Tables adds prescriptive standards for Tubular Daylighting Devices and makes no changes to existing values applicable to skylights). Justification for previously adopted standards can be found in the record of the rulemaking proceeding under which it was adopted. Staff additionally notes that curb-mounted skylights do not have U-factor requirements equal to vertical fenestration, and that skylights that do not achieve the prescriptive U-factor requirements may still be installed using the performance approach to compliance. Staff finds that it is unclear how the study included with the commenter's comment letter supports an assertion that "only very exotic and expensive custom units can comply [with prescriptive requirements]" or that the standard is "discriminatory": the study examines the costs and impacts of skylights with a U-factor of 0.24, significantly below the maximum U-factor values of 0.46, 0.58 and 0.88 for deck-mounted glass, curb-mounted glass and curb-mounted plastic (respectively), and does not address the market availability of higher U-factor products. That said, to the extent that the commenter has new information that would indicate a problem with a prior cost analysis, the commenter is encouraged to submit a complete code change proposal that identifies the prior rulemaking and specific documents relied upon that need to be reexamined, along with relevant data and documentation showing how an alternate conclusion is (or should be) reached. Staff would then be able to consider the code change proposal as a part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222851	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	110.10(b)2.A: Mandatory requirements for solar ready: Given probable loads in most climate zones this square footage given perfect proportions would accommodate a 3.5kW array which is less than half of what a typical 1600s.f. home will require to reach net zero energy. Is this realistic? Are we misleading designers into thinking that low-load homes will need such a small array? Given that a 1600s.f. home has about 2000sf. of roof, the allocation of 250s.f of roof area seems inadequate. In multi-family scenarios, more lenient rules could apply. There are numerous exceptions that allow less solar area. Some allow compensatory measures such as OCST thermostats and energy star appliances. These exceptions seem too lenient if you are trying to actually go zero energy.	Staff notes that the specification in Section 110.10(b) is a *minimum* specification, consistent with the overall purpose of Part 6 in setting minimum standards; staff finds that the purpose of the minimum solar zone requirement is to ensure sufficient reserved space for a cost effective solar array, noting that the size of the space is generally sufficient for a minimally sized PV array consistent with Section 150.1(c)14. Staff finds that requiring reservation of a sufficiently large area to account for all possible electric loads would greatly and unnecessarily restrict building design, and would exceed what has been found to be feasible and cost effective to require in newly constructed buildings. Staff therefore does not find that making the suggested change would be appropriate. (To the extent that the commenter is intending to propose a specific, larger square foot area for the minimum solar zone, staff invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	110.10(b)2.A: Mandatory requirements for solar ready: Section 110.10 makes no allowances for other types of renewable energy. The CEC should make it clear that they would be allowed if developed.	Staff finds that alternate component packages are able to be considered under 10-109, should such alternatives be developed. Additionally, staff is able to consider any new proposal as a part of the next triennial revision to Part 6. Staff does not find that adopting speculative regulations or standards applicable to products or technologies that are not yet fully developed would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	110.2 Appliance Efficiency Charts a-k (pages 94-107 of pdf): These charts show great variety in systems from commercial capacities to VRF multi-splits, but none of the capacities and none of the descriptions specifically correlate with minisplits with typical capacities of 6000 to 12,000 BTU. The chart includes PTAC units but those are categorically different. Is this an oversight?	Staff finds that the charts are aligned to federal equipment classifications and categories, not to common breakpoints in the associated device markets. Thus, this is not an oversight but a necessary aspect of alignment with federal appliance efficiency standards.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1 (c) 1. IAQ Filtration in Non-Residential and Hotel Buildings: MEUS supports limiting the requirement for MERV 13 for outdoor air filtration only to areas that have high ambient PM2.5 (i.e., ear busy roadways); and, for economizers which bring in outdoor air in commercial applications. In addition, the language should provide for the use of one inch filters.	Staff has added a provision that allows for use of one-inch filters meeting minimum sizing requirements, consistent with the commenters suggestion. Staff finds that most of the State experiences unhealthful levels of particles at some time during the year, and with increasing population, changing climates and increasing disasters (e.g., wildfires), it is not possible to conclusively predict where exceedances will occur or where subsequent construction (of buildings or roadways) will increase local emissions / traffic conjestion or impact local air quality. A uniform statewide requirement provides equal protection to all citizens in newly constructed buildings, make implementation and enforcement easier, and future-proof construction for the 30-year time horizon typically considered for low-rise residential buildings. Staff additionally notes that higher MERV ratings mean increased efficacy at filtering larger particulates such as PM10, where the state is almost universally in nonattainment status. Staff therefore does not find that limiting filtration requirements based on existing busy roadways would be appropriate, as staff finds that the ability to use higher MERV filters is beneficial in all areas.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1 (d) IAQ Ventilation in Non-Residential and Hotel Buildings: Requiring outdoor air “be supplied to each space at all times space is usually occupied” will unnecessarily waste a great deal of energy. Smart T-stats can identify occupancy patterns. Some buildings require occupancy sensors. This “usually” needs clarification. What is required here to meet this criterion? The building is either occupied or it is not. Fresh air should be supplied when it is needed.	Staff finds that identifying occupancy patterns can determine when the space is "usually occupied"; this phrasing accounts for any times that a reasonable person would usually expect someone to be present in the space, such as during business or work hours, and distinct from times when the space would not normally be occupied. Staff does not find that allowing air to grow stale when there is a reasonable expectation that the space is likely to become occupied at any time is necessarily appropriate; staff notes that two exceptions exist to this section to identify when such approaches would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1 (d) IAQ Ventilation in Non-Residential and Hotel Buildings: Requiring three air changes to an “entire building” in the hour before occupancy is unreasonable and should be struck from the text. Section 120.1(bc)2 are adequate.	Staff notes that referenced pre-ocupancy requirement specifies "[t]he lesser of the minimum rate of outdoor air required by Section 120.1(c) or three complete air changes shall be supplied[…]", underline added. Staff therefore finds that the existing requirement already aligns with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b) IAQ Fan Requirements: The requirements of this paragraph (vi - see page 8) seem unnecessarily stringent compared to the leniency of other paragraphs in this section. This requirement seems entirely impractical. It is better to limit the size of central IAQ units to 4 units and require that they be approximately the same cfm requirement in the first place, and then loosen the requirement to within 10cfm rather than a percentage. The amount of potential heat loss here relative to the headaches for the contractor and the HERS rater don’t compare to the gross heat loss caused by continuously operating exhaust fans as allowed above.	Staff updated the tolerance specified for IAQ (found in Section 150.0(o)1F) from ten percent to twenty percent, consistent with the commenter's suggestion. To the extent that the commenter is proposing an alternate approach to the ASHRAE specifications and procedures for central IAQ referenced in Section 120.1(b), staff notes that the comment does not explain in what way compliance with these provisions is impractical or in what way the commenter's approach is better; staff therefore invites the commenter to submit a complete code change proposal, including a complete analysis of the costs and benefits of their proposed alternate approach, for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: MEUS strongly supports ASHRAE Standard 62.2 guidelines.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: We also recommend anticipating technological innovation in controls that will allow dedicated IAQ fans to operate more like economizers, bringing in fresh air at optimal times to cool conditioned space at night during periods of high cooling loads. Smart controls with RF communication can track cfm rates of multiple exhaust fans in the home so that a minimum of conditioned air is displaced, enhancing system efficiencies while meeting ASHRAE Standard 62.2 requirements.	Staff finds that the comment does not appear to suggest a specific change to the proposed language: Part 1 Section 10-109 is specifically intended to anticipate technological innovation and provide a way for the efficiency benefits of new products or technologies to be recognized. To the extent the commenter is intending to suggest that new prescriptive standards or mandatory requirements for "smart controls" be developed, staff invites the commenter to submit a complete code change proposal for the upcoming 2022 proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: We also strongly recommend against allowing continuously operating supply or exhaust only fans. Supply only scenarios will facilitate vapor drive which is a health concern as it pertains to potential condensation in wall assemblies. Exhaust only, as we have noted is not a good solution. There are very affordable products that provide balance ventilation on the market.	Staff finds that Part 6 adopts ASHRAE 62.2 by reference, an internationally recognized ANSI standard that gives specification for ventilation and acceptable indoor air quality in residential buildings. ASHRAE 62.2 allows use of continuously operating supply and exhaust ventilation systems; staff's action to update the reference to 62.2 to its latest version included evaluation of the differences between versions, and both versions allow for these approaches to ventilation. Staff has adopted provisions for supply-only and exhaust-only scenarios in order to mitigate the known issues of infiltration from adjacent interior spaces; staff does not otherwise find sufficient justification in the record to fully prohibit these approaches. To the extent that the commenter believes they have data that would justify a prohibition, staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: We do not feel that high filtration requirements are necessary on dedicated IAQ fans except in nonattainment areas.	Staff finds that California is nearly universally in nonattainment for PM10, which is captured more effectively in a higher MERV filter. Staff additionally finds that new, subsequent construction can cause an area currently in attainment for PM2.5 to fall to nonattainment status. Staff therefore does not find that limiting application of improved filtration requirements to current nonattainment areas to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: We strongly recommend making IAQ fan systems separate from central air handlers because their lower air flow rates are conducive to higher filtration rates without a serious impact on efficiency.	Research by Laurence Berkely National Laboratory and California Air Resources Board has determined that MERV 13 filtration should be used on both outdoor air supply and on the return/recirculated airflow in space conditoning systems to eliminate the particulate contamination that enters the dwelling from outdoors or is generated from sources inside the dwelling such as by kitchen cooking activities. Ref: Singer B, Delp W, Black D, Destaillats H, Walker I. Reducing In-Home Exposure to Air Pollution. 2016. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Pressure drop characteristics of air filters vary widely, and are not directly dependent on MERV ratings in the MERV 6 to13 range. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone. Filters of any MERV rating must be sized correctly in order to ensure filtration does not adversely affect the performance of an HVAC system. Ref: Staff Analysis of Air Filter Pressure Drop and Air Filter Sizing (April 2018). https://efiling.energy.ca.gov/getdocument.aspx?tn=223260	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)1.4 & 2.A IAQ Fan Requirements: We strongly recommend requiring dedicated ERV or HRV fans with high filtration rates located specifically in areas away from vapor sources.	Staff notes that Title 24,Part 6 adopts ASHRAE 62.2 by reference, and 62.2 allows use of supply and exhaust ventilation systems in addition to ballanced (HRV/ERV) ventilation systems. Staff does not find that limiting these available approaches as a part of Part 6 efficiency standards would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)2.Aiii IAQ Fan Requirements: These two references under this section appear on the same page but make reference to two different standards for verifying building leakage (see page 7). The first is consistent with HERS practices; the second is a convention used by NFRC to verify window leakage and does not normally apply to envelopes. They should be consistent.	Staff finds that ACH50 and CFM50 per square ft of enclosure area are both specified by ASHRAE 62.2, so both are needed: ACH50 is used for charactizing overall building infiltration of single family and horizontally attached dwellings (town homes) in order to determine the required amount of mechanical ventilation airflow for the dwelling, while CFM50 per sqft of dwellng unit enclosure area is used to characterize the compartmentalization airtightness of multifamily dwelling enclosure surfaces (ceiling, floor, walls), and is not used for energy or ventilation airflow rate calculations. Both metrics rely on the CFM50 result from a blower door test.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)2.Aiii IAQ Fan Requirements: We encourage the 2ACH50 standard as it is reasonably achievable and significantly reduces cooling and heating loads. We support incentives to create low load homes.	Staff notes that the 2 ACH50 default enclosure leakage airflow is used to calculate the default infiltration component of the required whole-dwelling ventilation for single family detached dwellings and attached dwellings that do not share ceilings or floors with other dwelling units, occupiable spaces, public garages, or commercial spaces. High-rise residential dwelling units do not use the building infiltration to calculate the required indoor air quality fan airflow, therefore the calculation method that used 2 ACH50 was removed from 120.1 (as a part of also removing the term "horizontally attached", which similarly and incorrectly implied that low-rise townhouse-style multifamily units would be subject to this Section). As the value does not apply to high-rise multifamily dwellings staff does not find that reintroducing this value to this section would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)2.B IAQ Requirements: Although the section on natural ventilation has been deleted, we would like to go on record for including it. In low and high-rise buildings having operable windows greatly facilitates the health and safety of the occupants and this should be required in all categories of habitable structures. Operable windows should not supersede ASHRAE Standard 62.2 IAQ requirements. However, the other struck provision that follows this paragraph, which requires IAQ fans in each room, far exceeds requirements. We support measures to promote healthy buildings.	Staff notes that requirements for ventilation opening areas are specified in ASHRAE 62.2 Section 6.6, which is incorporated by reference (the language on natural ventilation was struck from Section 120.1(b) for redundancy with this ASHRAE section). Additionally, staff finds that research conducted by the California Air Resources Board and the California Energy Commission determined that dwelling occupants fail to open windows when the indoor air quality inside the dwelling is poor, thus mechanical ventilation has been required in every newly constructed dwelling unit. Ref: Offermann F. Ventilation And Indoor Air Quality In New Homes. 2009. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Staff therefore finds that the proposed language in the Express Terms is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.1(b)2.Bii IAQ Fan Requirements: This regulation does not go far enough. In the context of tighter low-load homes, it is or can be detrimental to install oversized kitchen hoods. Many residences install expensive commercial grade fans with 800-1200 cfm which poses significant depressurization issues. This category of product needs to have maximum cfm requirements to prevent particulate infiltration and potential back-drafting of combustion appliances. This is an important health and safety issue.	Staff finds that ASHRAE 62.2 Section 6.4.2 requires that, where atmospherically vented combustion appliances or solid-fuel burning appliances are located inside the pressure boundary, the total net exhaust flow of the two largest exhaust fans (not including a summer cooling fan intended to be operated only when windows or other air inlets are open) shall not exceed 15 cfm per 100 ft2 (75 L/s per 100 m2) of occupiable space when in operation at full capacity. If the designed total net flow exceeds this limit, the net exhaust flow must be reduced by reducing the exhaust flow or providing compensating outdoor air. Staff therefore finds that the proposed language in the Express Terms already addresses this potential issue.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.4 Air Distribution Ducts and Plenums: It also calls for a bit more detail about how the various UL181 tapes may be used. We recommend requiring that plenums be sealed only with mastic due to high pressure differentials at this point in the system. There is no mention of the prohibition against using traditional cloth backed tapes on ducting.	Staff notes that no edits are proposed to this Section as a part of this rulemaking, and that Sections 120.4(b)1D and 2D include a prohibition on cloth-backed tapes except in situations where mastic and drawbands are providing sealing. None the less, staff does not find (and the commenter does not present) any evidence that the other sealing methods able to be used to satisfy code are ineffectual or otherwise inappropriate. To the extent that the commenter has data or information showing a need to prohibit products other than mastics, staff invites the commenter to submit a complete code change proposal, including a cost analysis of restricting product and design options, for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.4 Air Distribution Ducts and Plenums: The phrase “as ducts and plenums” in this context (Section 120.4(a)) leaves the meaning of this paragraph open to interpretation. The above paragraph does not clarify whether or not building cavities may be used as ducts or plenums without sealed metal liners or custom square duct inserts. Although the CMC sections may clarify this point, we feel the text prior to this reference should unambiguously prohibit the use of chases, soffits or wood framed cavities to be used as ducts or plenums. As far as we understand, such use of wall cavities and wood plenums has been prohibited since the early 1990s.	Staff revised the language to remove ambiguity, consistent with the commenter's suggestion. The revised text reads as follows: All air distribution system ducts and plenums, including, but not limited to, building cavities, mechanical closets, air-handler boxes and support platforms used as ducts or plenums, shall meet the requirements of the CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0, and ANSI/SMACNA-006-2006 HVAC Duct Construction Standards Metal and Flexible 3rd Edition, incorporated herein by reference.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	120.4 Air Distribution Ducts and Plenums: this section would be a good place to insert a requirement that manufacturers of non-compliant “duct tape” be required to call it by a different name such as “multi-purpose tape” with a mandatory warning: “not to be used as duct tape”. This would prevent suppliers from putting these products on the shelf next to all the ducting supplies, as is now the case in all major consumer outlets.	Staff finds that the Energy Commission does not possess the authority to restrict or prohibit product naming in the way suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	By requiring OpenADR as the base communication protocol, MEUS believes that this will 1) reduce the ability for manufacturers to provide a comprehensive solution for Demand Response events issued by many Utilities; 2) put strain on manufacturers to develop multiple products which are to be used for the same application; 3) will result in high development costs that can cause significant market disruption; 4) cause unintended effects to customers; and 5) may cause future innovation to be stifled.	Staff does not find any evidence that the requirement to include a baseline communication standard is likely to have any of these effects, noting that staff has added language to allow use of a cloud-based VEN and thus remove the need to modify site-installed equipment. (Staff additionally notes that OpenADR is an existing requirement in JA5, going back to the 2013 version of Part 6.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Apparent Bias for In-Slab Hydronic Heating Systems: It is clear, given a few simple “back of the napkin” heat load calculations that all in-slab hydronic systems should have full slab insulation and even if they had it, would probably not qualify for DCS credit given heat loss through either R-7 or R-10 slab insulation. The states CBECC compliance software must provide for modeling the difference between having slab insulation and not having it. The fact that there is no way to model this option greatly inhibits the ability of designers to evaluate these cost and efficiency trade-offs.	Staff finds that this comment is in relation to the Energy Commission's modeling software, not to the Express Terms. Staff has therefore forwarded this comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Apparent Bias for In-Slab Hydronic Heating Systems: The code gives credit to hydronic heating generally because it eliminates ducts in attic, but does not require specification of whether wall radiators or in-slab radiant heat is used. Under 2% of the market uses wall panels, so the majority of these hydronic systems are installed in-slab and there are no requirements for full under slab insulation in any climate zone, resulting in higher BTU losses to ground than would be the case if there were a forced air system with ducts in the attic.	Staff finds that this comment is in relation to the Energy Commission's modeling software, not to the Express Terms. Staff has therefore forwarded this comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on FAU Cabinet Leakage, Remediation Measures and Safety Issues: Air handler leakage is a more significant issue and that tighter cabinet requirements are appropriate. We have heard reports of some manufacturers having high FAU cabinet leakage and invalidating warranties if HERS raters or contractors try to remedy the problem in the field. This is a catch-22 situation for installers and needs to be remedied in the following manner: 1) Require high cabinet sealing requirements: .5cfm at 50pa leakage or better; 2) Require that all manufacturers provide in-field cabinet sealing measures and recommendations that do not void warranties. This may include high-temp caulking that meets fire requirements and that will not introduce contaminants into the conditioned air.	Staff notes that Joint Appendix JA9 provides qualification requirements for Low Leakage Air Handling Units (LLAHU), consistent with the commenter's suggestion. Performance compliance credit is available when a LLAHU is specified for the performance compliance approach. Generally, LLAHU credit applies to air handling units that have been sealed at the factory, and have been tested in accordance with ASHRAE Standard 193 to ensure they will leak less than 1.4 percent of the nominal air-handling unit airflow. The Standards do not prohibit an installer from performing cabinet sealing in accordance with manufacturer recommendations. The duct system (which includes the air-handling unit) is required to meet the mandatory duct leakage requirements given in Section 150.0(m)11. (To the extent that the commenter is proposing that the LLAHU certification be made mandatory for all installed equipment, staff notes that this has the potential to increase equipment costs and that a cost analysis would therefore be required in order for the Energy Commission to consider the measure. In this case, staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking proceeding.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Furnace Replacement Requirements: Regulatory agencies (CEC, CSLB, EPA) need to work in a concerted effort to decrease replacment violations and improve funace installation compliance. (see Comment #15 pages 14-15 for specifics)	Staff notes that there is a separate proceeding focusing on enhancing compliance with regulatory requirements; staff does not find that this comment either relates to a proposed amendment in the Express Terms or proposes to amend the Express Terms. Staff has passed this comment on to appropriate personnel involved in the separate compliance proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on HPA Design and Serviceability of Ducts in Conditioned Space: Given the importance of duct leakage, and the prevalence of flex ducting in the industry, we feel it is a mistake to conceal ducts in chases and soffits without provision for their serviceability.	Staff finds that conceling ducts in chases and soffits is a well-established industry standard practice; significant evidence would be required in order to establish that prohibiting this industry standard practice is necessary or justified. Staff therefore invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on HPA Design and Serviceability of Ducts in Conditioned Space: Given the new HPA requirements in the code and the obvious advantages of HPA measures under the various options offered, we strongly support these measures as they promote much lower HVAC load conditions generally, and are likely to have high efficiency to cost ratios.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on HPA Design and Serviceability of Ducts in Conditioned Space: the term “plenum” which the CEC has chosen to refer to sealed compartments that house HVAC systems including their ducts, air handlers and supply and return plenums, is inherently confusing. It will not be uncommon to have HVAC return and supply plenums inside this “plenum” (sealed plywood compartment). We humbly suggest changing this confusing term everywhere it may appear in the Standards and the Compliance Manuals.	Staff notes that Section 150.0(m)1E specifies the following: Building cavities, support platforms for air handlers, and plenums designed or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts. The commenter did not provide a reference to the objectionable use of the term plenum, and staff does not find that the few places where the term is used are either incorrect or confusing.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on TDV Calculations and Apparent Bias Against All-Electric ZNE Structures: It appears that it is much harder for all electric homes to qualify for compliance credit through CBECC or Energy Pro for both residential and commercial projects. One possible factor is the source energy factors that give a three to one favor to gas appliances over electric appliances due to a 70% distribution loss when appliances are powered through the grid. However, many ZNE homes are powered by solar which mitigates against grid efficiency losses during the day. The nature of time dependent valuation of energy is such that nighttime usage is inherently inexpensive, so TDV should only be increased for these appliances in the new peak hours: the hour before and after dust and dawn when demand is still high and solar production is lower.	Staff notes that this comment is in relation to the CBECC software and not to the Express Terms within this proceeding. Staff has forwarded the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on TDV Calculations and Apparent Bias Against All-Electric ZNE Structures: MEUS will continue to press for all-electric prescriptive options that will achieve actual TDV parity with .80 AFUE alternatives that are currently allowed. This includes allowances for high-efficiency heat pump HVAC systems (ducted and ductless) as well as HP water heating technologies with integrated or outdoor condensers that meet TDV equivalence. We believe these technologies present numerous product advantages for home owners and the general public and they deserve a level playing field.	Staff has expanded the prescriptive options for electric equipment, consistent with the commenter's suggestion. (Staff notes that specific consideration of unit performance is provided by the performance approach to compliance.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on TDV Calculations and Apparent Bias Against All-Electric ZNE Structures: We also encourage discussion between the CEC, the PUC and the IOUs regarding time of use metering and rate payer education so that people are not running their dishwashers during these peak periods. We presume there are already working groups discussing these grid management issues. We further support DR controls, improved VRF controls, EMS technologies to alleviate these power management concerns, which will also improve TDV calculations and compliance credit ratings of all electric ZNE homes.	Staff is working with the PUC and with California's utilities on further refinements of load management and demand response topics; staff anticipates that these discussions will lead to additional proposals in future rulemaking cycles, consistent with the commenter's expression of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on TDV Calculations and Apparent Bias Against All-Electric ZNE Structures: we ask that you please have your staff respond to these fundamental concerns about TDV and the creation of a level playing field for all-electric ZNE homes in the near future. We are desirous of ongoing discussions with the CEC until to resolve all of these issues in time for the release of the 2019 versions of CBECC and are committed to furthering the discussions and continuous improvement of our product lines until we have achieved TDV parity for the all-electric ZNE scenario.	Staff finds that TDV is an accurate assessment of incurred monetary costs of electricity generation and distribution that must necessarily be passed on to consumers; staff are committed to continual refinement of TDV for each successive code update cycle, and are happy to continue discussions with stakeholders as requested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Whole House Fans: We advocate for requiring analog timers and eventually phasing-in differential controllers to turn whole house fans off while residents are sleeping with sensors to detect delta-T between indoor and outdoor temperatures. Provisions should also be made to integrate these systems into unvented attics and require dedicated make-up air sources so WHFs can be programmed to cool the house even if residents are not home. This is another reason to scale down the cfm requirements.	Staff finds that these additional control, behavior and equipment requirements are likely to increase equipment costs, and that a cost analysis would therefore be necessary for the Energy Commission to consider the proposal. For this reason, staff does not find that it would be appropriate to adopt these requirements at this time; staff invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Whole House Fans: We suggest that the CEC reconsider its 1.5cfm/sf requirement for whole house fan minimum capacity. It is conceivable that this standard may be appropriate for very hot climates (CZs 14 & 15?) and perhaps not for more moderate climates. Although, 1.5cfm/sf is already a reduction from earlier standards, it is still a high enough rate of flow to achieve a full air change in just 5 to 6 minutes. A .5cfm/sf standard would work in most other climates, be more efficient and achieve a full air-change in just 16 minutes.	Staff notes that the whole house fan (WHF) prescriptive requirement was determined based on in-depth research as presented in the CASE study submitted to the 2013 Title 24 Standards update, and no analytical information is present in the record of the current proceeding by which staff or the public could evaluate an alternate value. Staff therefore invites the commenter to submit a complete code change proposal regarding the proposed 0.5 cfm/sqft value with all necessary analysis for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Comment on Zoning Plenums combined with Gas Furnaces: HVAC zoning plenums on any type of combustion furnace should be prohibited due the high likelihood of reduced airflow scenarios that can cause significant inefficiencies, but more importantly, can lead to premature failure and catastrophic failure of heat exchangers, greatly increasing CO poisoning hazards. This is a considerable safety concern. Given the move toward efficiency and safety, more stringent flow and watt-draw requirements, and the engineering failure modes of these systems, they should be prohibited in 2019.	Staff finds that Section 150.0(h)4A requires all central forced-air heating furnaces to be configured to operate in conformance with the furnace manufacturer's maximum inlet-to-outlet temperature rise specifications. Additionally, Section 150.0(m)13 provides detailed direction coupled with HERS verification to ensure adequate airflow in every control mode in zonnaly controlled central forced air systems that are applicable to gas furnace air-handling units when they are used for supplying both heating and cooling to occupiable spaces. (These are existing requirements that the Express Terms do not propose to change.) New zonally controlled forced air systems requirements are not proposed by the 2019 Title 24 Part 6 update, and as prohibition of use of zonally controlled systems is a substantive change that could affect costs, the Energy Commission would need a cost analysis in order to consider this proposal. Staff therefore invites the commenter to submit a complete code change proposal including all necessary analysis for the 2022 rulemaking proceeding. That said, staff has the understanding that forced-air gas furnace heaters are federally regulated appliances that are safe, and staff is not aware of evidence that forced-air gas furnaces should be prohibited. The commenter has not provided evidence that indicates only zonally controlled gas furnace heaters should be prohibited, which is significant because improper installation of gas furnace heaters that are not zonally controlled could also result in damage to these appliances.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Note on “UV Scrubbers” and IAQ: In the interest of public health, we request that your staff interface with the appropriate regulatory agency to restrict use of these devices in California and include education about their harmful effects in your IAQ classes at the Energy Centers. (See separate files containing CARB and Cal EPA information on UV scrubbers uploaded to the docket separately following these comments.)	Staff notes that this comment neither relates to aproposed amendment in the Express Terms nor proposes to amend the Express Terms; staff has forwarded the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Notes on HVAC, IAQ and Health and Safety: It is our perception that the 2019 Code and CBECC modeling do not go far enough to give adequate and equitable compliance credit to advanced HVAC technologies such as variable capacity heat pumps (VCHP) and variable refrigerant flow (VRF), that are so critical to making all electric ZNE homes affordable. We commit to the CEC to provide whatever resources necessary to remedy this problem and request dialogue at every level of the CEC in regard to resolving this compliance credit issue quickly.	Staff notes that this comment relates to the CBECC modeling software and neither relates to aproposed amendment in the Express Terms nor proposes to amend the Express Terms; staff has forwarded the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Notes on HVAC, IAQ and Health and Safety: MEUS strongly supports provisions that accommodate the all-electric ZNE home.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	General Notes on HVAC, IAQ and Health and Safety: We strongly recommend that the 2019 code require sealed-combustion (condensing) appliances with a minimum efficiency of .90 AFUE for all residential and commercial applications.	Staff finds that the proposed specification would conflict with federal appliance law and would not be enforceable due to preemption. For this reason, staff does not find that adopting the specified standard would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	It is probable that manufacturers can guarantee a specific air handler watt draw will not exceed .58watts/cfm based on a system not exceeding a specific design static pressure. But these system efficiencies are far more easily achieved at a lower installed price if the CEC would mandate “new-school” approaches to system design (i.e. Chitwood School of Thought). The proposal appears to be based on a few sample tests in narrow product categories and it is not the most feasible or cost-effective strategy.	Staff finds that the new federal regulations will require furnace fans to provide minimum efficiency equivalent to the constant torque brushless permanent magnet (BPM) type motors used in multi staged furnaces. The federal regulatins are scheduled to become effective July 2019; staff has added an exception to relevant sections to align with this effective date. To the extent that the commenter is intending to propose new mandates on HVAC system design, staff invites the commenter to submit a complete code change proposal (including a complete and specific description of the "new school" or "Chitwood school" of system design) for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	MEUS agrees that is it in the best interest to consolidate all information related to Demand Response in one section as is being proposed.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	MEUS agrees with CEC requirements for manufacturer installed measurement access hole (MAH) and our member companies universally offer installation training and technical support. We agree that static pressure should be measured by a HERS rater or installer without risking damage to equipment and heat exchangers by drilling MAHs in the field.	Staff appreciates the comment of support; staf notes that the MAHs are expected to be installed in the field as required by Standards sections 150.0(m)13A, and 150.1(c)7Aia, and as described in RA3.3.1.1 and RA3.2.2.3. There is no requirement tha the holes be provided by the manufacturer, however, if the holes are not provided by the manufacturer, the installing contractor will have to install the holes. (The HERS Rater is required to verify the holes are installed, but the HERS Rater is not expected to install the holes.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	MEUS recommends that refrigerant charge verification method for VSMS systems recommended to CEC by AHRI be adopted in all climate zones.	Staff does not find that a refrigerant charge verification method is recommended by AHRI in the comments or other materials submitted to this proceeding, and does not otherwise find sufficient information in the rulemaking record for consideration of an alternate verification method. (Staff notes that the current weigh-in method is applicable to these systems; to the extent that the comment may be expressing support for this method, staff appreciates the comment of support.) If an alternative method is desired, staff invites the commenter to submit a complete code change proposal analyzing the desired method for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Motor efficiency improvements are only beneficial if combined with intelligent “new-school” duct design which should be mandatory in the 2019 code (but is conspicuously absent or only recommended practice) as it can improve system efficiencies by 30% to 50% at a lower cost than conventional duct system design (fewer ducts, shorter runs, less install labor, buried ducts, bar type grills, central damper control, oversized plenums and returns to facilitate better flow and filtration, etc.).	Staff notes that the commenter describes "new school" duct design in only general terms; staff invites the commenter to submit a complete code change proposal, including specific minimum standards for duct design and all necessary analysis, for the 2022 rulemaking proceeding. Staff does not find, absent greater specificity and necessary analysis, that adding new standards for duct system design to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Other General Comments on Ducting Requirements: Cloth backed UL181 tapes are inadequate for general use. The code allows them to be used with mastic and ties, but not on plenums. They are inferior and this standard is too confusing to be accurately followed by installers and inspectors in the field. It relies too heavily on small HVAC contractors to train their staff. Many do not.	Staff finds that cloth backed tapes complying with the noted UL standard can provide adequate air sealing if installed appropriately, which may require appropriate training; staff notes that appropriate installation is a necessary assumption for all building systems and equipment. To the extent that the commenter is proposing that this equipment be prohibited by Part 6, staff invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding. Staff otherwise does not find that prohibiting this material based solely on the contents of this comment letter to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Other General Comments on Ducting Requirements: Duct board is a terribly inferior product to other duct types and should have been regulated out of existence years ago. It is a compromise to public safety (fiberglass a suspected carcinogen) and cannot be reliably installed to meet leakage requirements with durability over time. The code should explicitly prohibit its use.	Staff finds that a prohibition on the use of a material or product must be based on specific information about the products performance, noting that the commenter does not provide specific analytic data or performance information that could be used to justify their proposal. Staff therefore invites the commenter to submit a complete code change proposal on this topic for the 2022 rulemaking proceeding; staff otherwise does not find that prohibiting this material based solely on the contents of this comment letter to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Other General Comments on Ducting Requirements: Multi-family duct leakage allowed (12%) is ridiculously high compared to single family standards.	Staff notes that the 12% leakage value for multifamily was determined by the following research: Proctor, et al. Efficiency Characteristics and Opportunities of New California Homes. California Energy Commission. https://efiling.energy.ca.gov/getdocument.aspx?tn=222338 As the commenter does not provide information that would justify an alternate value (nor propose a specific alternate value) staff does not find that changing this requirement at this time would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Proposal to Add HPA Option “D”: we would argue for an HPA option “D” (corresponds to ductless), that would allow the HPA attic savings to help offset any differences in system installation costs. We advocate for R-60 blown insulation so that total insulation levels (ceiling+deck) are comparable to the other HPA options. Given the system advantages and efficiencies achievable with multi-split systems, we feel the addition of this option would create a more level playing field with the competing options that you have already implemented.	Staff finds that the commenter's proposal lacks substantiating analysis and data, for example information that would verify that 60 is a correct (and not arbitrary) level of insulation for this circumstance. Staff therefore invites the commenter to submit a complete code change proposal, inclusive of all necessary analysis showing that the proposed approach achieves equivalent or superior results to the specifications in Part 6, for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Recommendation: It is strongly recommended that the Commission expand the requirement of OpenADR (to allow protocols and interface technologies to mature). MEUS proposes that section 110.12.a.1 be amended to allow for a nonproprietary open protocol to be used with or in place of OpenADR. The following changes are requested in red: (a) Demand responsive controls. 1. Section 110.12.a.1 states: "All demand responsive controls shall be ~~capable of functioning as~~ an OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN), as specified under Clause 11, Conformance, in the applicable OpenADR 2.0 Specification or by using an open protocol or both."	Staff finds that specifying an "open protocol" with no further specification of the protocol's capabilities or features would have the effect of permitting protocols that are incapable of providing demand response functionality to be considered as complying with this section. Staff additionally finds that a complete statement of the functions and abilities expected for such a protocol would result in effectively restating the extant OpenADR specifications given that the OpenADR protocol was expressly designed to provide the baseline demand responsive features and behaviors expected for demand responsive equipment. Staff therefore does not find that making the suggested amendment would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Recommendations on Duct Design as it Pertains to Fan Efficiency and HERS Verification: In a collaborative effort to meet CEC goals and make ZNE homes affordable in this code cycle, ME US recommends that low-cost building measures that save more energy than more costly technical solutions be implemented before or simultaneous to costly mechanical system requirements. This cost prioritization of measures is consistent with the stated goals of the CEC but does not appear to be emphasized in the structure of the Code. A calculation method for kWh and BTUs/dollar should be factored into to the prioritization of new code requirements.	Staff finds that the building energy eficiency standards are required by statute to be cost effective and technically feasible; staff already prioritizes new measure proposals by their potential energy savings and cost effectiveness, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Recommendations on Duct Design as it Pertains to Fan Efficiency and HERS Verification: We are recommending a rethinking of these priorities so as to offer adequate development schedule lead-times for manufacturers as well as time to institute statewide trainings and new "CEC-certifications" (or NCI, BPI, NATE, etc.) for subcontractors and general contractors on building science principles. CSLB mandated "tailgate meetings" should be expanded to cover documented QC topics (signed by attendees) so that construction workers in the field are well versed on relevant issues of building science and "new-school" thinking that the CEC is trying to promote. Quality control starts with the assembly line worker and the construction worker alike, and more QC is needed in the field than can be provided by CEA analysts and HERS raters.	Staff finds that the Energy Commission does not possess the authority to direct the Contractor's State License Board with respect to its requirements, and therefore that adding requirements related to CSLB-specified "tailgate meetings" into Part 6 would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Section 150.0 Filtration Requirements & Challenges of Meeting IAQ Requirements with CFI systems: To meet the CEC's higher IAQ filtration requirements while avoiding numerous product engineering challenges that may not be met in such a short development cycle, MEUS recommends eliminating CFI systems (central fan-integrated IAQ) from central FAUs. (provides 5 reasons see Comment #18 page 19)	Staff finds that Central Fan Integrated ventilation strategies have been available for use for compliance with the 150.0(o) mechanical ventilation requirements since ASHRAE 62.2 was first adopted by reference by the 2008 Title 24, Part 6 standards. Staff understands that the most common type of CFI ventilation system is simply a duct between the return plenum of the space conditioning system an an outdoor air inlet opening, and that operation of the central fan for the sole purpose of providing outdoor air is generally less energy efficient than other ventilation system types. However, when the space conditioning system operates to provide comfort cooling, the ventilation air is provided for "free" since no additional fan energy beyond that needed for comfort cooling is used. Section 150.0(o)1B prohibits continuous operation of CFI ventilation systems for the sole use of providing IAQ ventilation. The CBECC performance compliance software calculates the additional fan energy used when a CFI ventilation system fan cycler control is used to run the central fan for short periods when comfort cooling is not called for but ventilatin air is required, thus the energy penalty is accounted for in the performance compliance method. Pressure drop characteristics of air filters vary widely, and are not directly dependent on MERV ratings in the MERV 6 to13 range. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone. Filters of any MERV rating must be sized correctly in order to ensure filtration does not adversely affect the performance of an HVAC system. (This highlights the need for air filter labeling, which California has addressed by requiring filter labeling within Title 20.) Staff understands that use of MERV 13 filters would not cause the equipment failures or prevent compliance with the 0.45 w/cfm fan efficacy requirements as claimed by this commenter. ref: Staff Analysis of Air Filter Pressure Drop and Air Filter Sizing (April 2018). https://efiling.energy.ca.gov/getdocument.aspx?tn=223260. Ref: Walker, I. S., Dickerhoff, D., Faulkner, D., & Turner, W. J. N. (2013) System Effects of High Efficiency Filters in Homes. LBNL-6144E; Walker, I. S., Dickerhoff, D., Faulkner, D., & Turner, W. J. N. (2012). Energy Implications of In-Line Filtration in California. CEC-500-2013-081. https://efiling.energy.ca.gov/getdocument.aspx?tn=222366 Research by Laurence Berkely National Laboratory and California Air Resources Board has determined that	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	The 2016 Residential Compliance Manual seems to go out of the way to avoid mention of mini-split and multi-split systems discussion of mini-splits and in numerous parts of the text where their advantages are in fact significant in avoiding other construction costs while providing other benefits and increasing efficiency. They are not mentioned in the section on zoning, and they are also conspicuously absent from any discussion of compliance credit for eliminating ducts in the attic. Mitsubishi Electric US would like to promote direct and ongoing discussion with CEC staff regarding these omissions, and commit the resources necessary to comply with all equipment certification requirements and can do so immediately and within the next 6 months so as to facilitate proper rating of equipment with both the CEC and AHRI.	Staff notes that this comment relates to the Compliance Manuals and not to the Express Terms; staff has forwarded the comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	The CEC should require duct layouts and calculations using Wrightsoft or a new competing program, provided that it has sufficient detail: a punch-list of system details and notes such as return grill area, duct diameters and the new-school design details such as bar-type damperless grills at most of the supplies and longer supply plenums to accommodate centralized dampered control of the larger habitable spaces.	Staff notes that a requirement to use specific software or conduct specific work has the potential to increase costs, and that a cost analysis is therefore necessary in order for the Energy Commission to consider the proposal. Staff therefore invites the commenter to submit a complete code change proposal on this topic, including all necessary analysis, for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	The cost to integrate ECM motors that are 20% to 25% more efficient, but which improve overall system efficiency by only 5% to 12% (here estimated, considering condenser kW usage) may be an ineffective strategy, or quickly invalidated by poor systems integration on the part of Wrightsoft designers and installers.	Staff finds that the new federal regulations will require furnace fans to provide minimum efficiency equivalent to the constant torque brushless permanent magnet (BPM) type motors used in multi staged furnaces. The federal regulatins are scheduled to become effective July 2019.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Unilaterally requiring near term improvements in motor efficiency to meet the .45watt/cfm requirement across all product categories could result in "panic mode" development schedules that are extremely disruptive to our business model and which may be impossible to achieve given other upgrades currently proposed in the 2019 code such as MERV13 filtration requirements. Significantly increasing filtration rates at the same time that watt-draw is to improve by 25% introduces two new criteria that are known to be in direct opposition to each other. Under all normal design circumstances, and given the basic physics involved, higher filtration rates inherently increase static pressure and watt-draw. Such oppositional variables will require serious rethinking and redesign of entire product lines across the entire industry with less than a year of development time remaining and with even tighter tooling and manufacture engineering schedules. Imposing such stringent and oppositional regulatory requirements simultaneously, and with inadequate forewarning and lead times will inevitably lead to crisis management scenarios for manufacturers, increased product failures, higher costs to consumers, and market disruption.	Staff finds that the 0.45 w/cfm requirement specified in the 2019 Title 24, Part 6 standards is specific to gas furnaces that will be required to meet a new federal fan energy requirement effective July 2019. The new federal regulations will require furnace fans to provide minimum efficiency equivalent to the constant torque brushless permanent magnet (BPM) type motors used in multi staged furnaces. This means that in 2019 the minimum efficiency furnace fan will become more efficient than the 2006 standard furnace fan, for which permanent split capacitor (PSC) type fan motors were typical. To account for the change in minimum furnace fan efficiency, it was proposed that the California Title 24 fan efficacy requirement should be modified to 0.45 W/cfm. Laboratory testing was conducted to evaluate the reasonableness of the proposed fan efficacy requirement. A variety of furnace fans that are representative of today's low to moderate cost BPM furnaces were tested. All of the tested furnace fans were able to demonstrate compliance with the proposed fan efficacy limit of 0.45 W/cfm, while still producing at least 350W/cfm airflow at the typical rated cooling speed static pressure of 0.5 IWC. All of the tested furnaces were also compliant with the proposed Title 24 requirements when evaluated on a system curve corresponding to the Federal test procedure for the 2019 furnace fan efficacy requirements. Proctor Engineering Group, 2017. Residential Furnace Blower Performance Testing. https://efiling.energy.ca.gov/getdocument.aspx?tn=222296 Pressure drop characteristics of air filters vary widely, and are not directly dependent on MERV ratings in the MERV 6 to13 range. HVAC system static pressure is not affected by the use of filters with MERV 13 ratings alone. Filters of any MERV rating must be sized correctly in order to ensure filtration does not adversely affect the performance of an HVAC system. This highlights the need for air filter labeling, which California has addressed by requiring filter labeling. https://efiling.energy.ca.gov/getdocument.aspx?tn=223260	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	VRF and VCHP Test Criteria and Protocols: MEUSS would like to take the lead to form a working group with the CEC and other Industry Stakeholders to develop and installation performance criteria and installations protocols for these systems. MEUS is committed to this effort and desires open and ongoing discussions with CEC staff to facilitate rapid development of these protocols. In a spirit of collaboration, we would appreciate ongoing communication with CEC staff to resolve these test protocol issues.	Staff is open to working with this and other stakeholders on the future development of improved installation and testing protocols.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	We are suggesting that the interface between CBECC and Wrightsoft be improved to facilitate responsible and efficient duct design without the redundancy of having to re-enter data.	Staff notes that this comment relates to the CBECC modeling software and not to the Express Terms; staff has forwarded the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	When room by room zoning is desired, multi-split systems are the technology of choice, and yet these are not even mentioned under the zoned controls of the CECs 2016 Residential Compliance Manual. Even if we were not focused on these technologies, we would argue for their inclusion in the Compliance Manuals. It is a matter of public safety and the greater good.	Staff notes that this comment relates to the Compliance Manuals and not to the Express Terms; staff has forwarded the comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018
222852	Douglas Tucker (Mitsubishi Electric US, Inc.)	Widespread training programs such as the CEC's statewide trainings at energy centers, (or NATE, NCI) should be mandatory for all licensed HVAC contractors and all system designers whether certified or not (low-rise residential does not require license or certs). Wrightsoft, duct-blasters, manometers, static pressure (pitot) tubes, refrigerant charge gauges, etc. should be mandatory installation equipment. Eyeball engineering needs to come to an end	Staff finds that the Title 24 Standards already specify use of field diagnostic instruments and procedures (as described in the Reference Appendices). Additionally, HERS verifications are required to ensure the installations have been implemented to meet expected performance, and HERS Raters are subject to education and training requirements. Staff additionally finds that the Energy Commission is not provided authority under the Business and Professions Code to set conditions for licensing of professionals covered by (and subject to) said Code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222853	William Callahan (Associated Roofing Contractors of the Bay Area Counties, Inc.)	Correction Needed: Exception to Section 141.0(b)2Biii - The problem is with Exception c. This exception allows variance from the requirements of Table 141.0-C, "provided that the conditions in Subsections i through iv apply." Subsections i through iv then go on to describe the various conditions that must be met to avail oneself of exception c. This is all well and good. The problem is with the inexplicable appearance of an unrelated Subsection v. Subsection v has nothing to do with the other provisions of Exception c. It deals with an entirely different situation. Accordingly, it should be renumbered as Exception d to Section 141.0(b)2Biii.	Staff has corrected the section numbering consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222853	3/5/2018
222854	Mark Stout (Apollo Energies)	Having a HERS Rater verify the energy efficiency measures, but ignores the PV measures, simply makes no sense. I would strongly recommend Commission staff reconsider third party verification for PV measures installed.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222854	3/5/2018
222854	Mark Stout (Apollo Energies)	I would also encourage Commission staff to identify alternate paths a HERS Rater can take to confirm compliance. Commission has in the past used the HERS registries as a portal for submission of compliance documents. While the vast majority of HERS Raters work well together without question, there are those who become territorial with their projects in the registry and will not share the project with another HERS Rater in a misguide attempt to extract ransom from other HERS Raters, to the detriment of the homeowner. An alternate path would alleviate this problem.	Staff does not find that the commenter's recommendation of "an alternative path" is specific enough regarding what form such a path would take, what features it would need to have and how it would prevent this situation from occurring for staff to develop or propose an amendment to the Express Terms. That said, staff will followup with the HERS Providers to discuss this issue and may propose a solution (if an appropriate solution is identified) for inclusion in a future update to the Data Registry Requirements Manual.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222854	3/5/2018
222855	Lyn Gomes (KW Engineering)	To improve code and prevent conflicts of interest and poor quality commissioning work, the following change should be made to the 45-day language: Add a definition for certified commissioning professional to section 10-102. The individual must be certified by an ANSI/ISO/IEC 17024:2012 accredited organization.	Staff finds that it would not be appropriate to add a definition for the term to Part 1 Section 10-102 as staff is not proposing to add the term "certified building commissioning professional" to Part 1 Section 10-103.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222855	3/5/2018
222855	Lyn Gomes (KW Engineering)	To improve code and prevent conflicts of interest and poor quality commissioning work, the following change should be made to the 45-day language: Add the option for a certified commissioning professional to perform commissioning work to Section 10-103(a)1, second paragraph	Staff finds that Division 3 of the Business and Professions Code is explicit in identifying persons who are eligible to accept responsibility for building design (responsible persons): under Division 3 of the Business and Professions Code, this eligibility is restricted to licensed architects, engineers, and contractors. The current language of this Section is accurate in describing the requirements of Division 3, and only imposes an additional requirement that projects of sufficient size be subject to a level of independent review. As the independent reviewer signing these documents must be capable of accepting responsibility for the building design, staff finds that including commissioning professionals in this list would be contrary to the requirements of Division 3. For this reason, staff finds that making the requested change would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222855	3/5/2018
222855	Lyn Gomes (KW Engineering)	To improve code and prevent conflicts of interest and poor quality commissioning work, the following change should be made to the 45-day language: Add wording to require a third party certified commissioning professional to do commissioning for large projects or projects with complex mechanical systems (in line with design review requirements in current code) to section 120.8(g).	Staff finds that adding a requirement that the person performing commissioning possess an ANSI certification or accreditation could potentially impose additional costs, as could a requirement that the commissioning provider be a third party. For this reason, staff finds that a complete code change proposal describing the costs and benefits of these requirements is needed in order to consider this suggestion. Staff invites the commenter to complete a code change proposal on this topic for the 2022 code cycle.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222855	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222856	Michael Ivanovich (AMCA International)	AMCA International believes the CASE recommendation to require induced flow fans and high-plume exhaust fans to be licensed to bear the AMCA seal of the AMCA Certified Ratings Program, AMCA strongly encourages that this requirement remain in the proposed language for Title 24.	Staff finds that the marginal cost for an AMCA Certified fan was not expressly considered in the cost effectiveness analysis presented in the documents relied upon for the proposed standards for laboratory fume hoods, and therefore the costs and benefits not specifically analyzed in a way that would allow for consideration of this additional requirement. (Staff was able to confirm with the authors of the proposal that AMCA certified fans were used for the study, however because these costs were not broken out neither staff nor the public had the opportunity to consider whether the costs of certification were commensurate with its benefit and whether the embedded costs for these fans were appropriate proxies for fans generally. Staff can, with additional and specific cost data, consider certification requirements as a part of the 2022 rulemaking.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222856	3/5/2018
222856	Michael Ivanovich (AMCA International)	Regarding the language used in the recommendation to require AMCA-licensed seals, there is a more correct way to specify such a requirement: The exhaust fan system, including fan, nozzle, stack and wind band shall tested in accordance with AMCA Standard 210 for high-plume exhaust fans, and AMCA Standard 210 and AMCA Standard 260 for induced flow fans. High-plume exhaust fans and induced flow exhaust fans shall be licensed to bear the AMCA seal for air performance (induced flow fans) in accordance with AMCA Publication 211. These corrections account for: 1) When certifying induced flow fans and obtaining the AMCA seal for induced flow fans, tests to AMCA 210 and 260 are required; 2) AMCA Publication 211 specifies what parameters are to be certified; what test standards are required.	Staff finds that the marginal cost for an AMCA Certified fan was not expressly considered in the cost effectiveness analysis presented in the documents relied upon for the proposed standards for laboratory fume hoods, and therefore the costs and benefits not specifically analyzed in a way that would allow for consideration of this additional requirement. (Staff was able to confirm with the authors of the proposal that AMCA certified fans were used for the study, however because these costs were not broken out neither staff nor the public had the opportunity to consider whether the costs of certification were commensurate with its benefit and whether the embedded costs for these fans were appropriate proxies for fans generally. Staff can, with additional and specific cost data, consider certification requirements as a part of the 2022 rulemaking.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222856	3/5/2018
222857	John Rose (Home Ventilating Institute)	Airfow Rating. HVI seeks an amended reference in 150.0(o)2B for the exception found in ASHRAE 62.2 Section 5.4 to address range hoods. Every HVI-Certified range hood is rated at High Speed, at 0.1" w.g., and this rating point is adequate to prove compliance to the minimum airflow recommended by ASHRAE 62.2. The Prescriptive Duct Sizing table 5.3 in ASHRAE 62.2 does not cover most range hoods' high-speed airflows, as it only extends to 300 CFM. In absence of a table that can be referenced for any potential range hood, please consider an Airflow Measurement exception specific to range hoods.	Staff did not implement the change proposed by HVI to exempt kitchen range hoods from airflow measurement; the HVI ratings at 0.1 inch w.c. already comply with the basic ASHRAE 62.2 rating requirement which satisfies the HERS verification proposed for the 2019 update to Title 24, Part 6. Use of ASHRAE 62.2 Table 5.3 for prescriptive duct sizing is not mandatory, and is only available for use for the alternative (to airflow measurement) compliance method if the manufacturer has elected to rate their range hood model at 100 cfm or more, at 0.25 inch w.c. static pressure. ASHRAE 62.2 has specified 0.25 inch w.c.. for the prescriptive duct sizing compliance method, thus staff has the understanding that a prescriptive duct sizing table based on 0.1 inch w.c. operating static pressure (as proposed by HVI) would not ensure compliant ventilation airflow.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222857	3/5/2018
222857	John Rose (Home Ventilating Institute)	An amended reference to Section 5.4 of ASHRAE 62.2, where Table 5.3 is not referenced, could clarify the exception to field measurement such that the airflow rating for Kitchen Range Hoods, according to Section 7.1, at high speed at a pressure of 0.1 in. wc (25 Pa) may be used, provided the duct sizing is 6" diameter or larger and meets the manufacturer's design criteria.	Staff did not implement the change proposed by HVI to exempt kitchen range hoods from airflow measurement. Use of ASHRAE 62.2 Table 5.3 for prescriptive duct sizing is not mandatory, and is only available for use for the alternative (to airflow measurement) compliance method if the manufacturer has elected to rate their range hood model at 100 cfm or more, at 0.25 inch w.c. static pressure. ASHRAE 62.2 has specified 0.25 inch w.c.. for the prescriptive duct sizing compliance method, thus staff has the understanding that an exclusion for ducts 6 inches or greater diameter (as proposed by HVI) would not ensure compliant ventilation airflow.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222857	3/5/2018
222857	John Rose (Home Ventilating Institute)	An amended reference to Section 7.2 of ASHRAE 62.2 could clarify that Kitchen Range Hoods may be rated for sound at a static pressure determined at working speed as specified in HVI Publications.	Staff implemented an exception to the 3 sone at 0.1 inch w.c. rating required by ASHRAE 62.2 to allow compliance with 150.0(o) using ratings for sound greater than or equal to 3 sone at working speed to relieve the burden for manufacturer retesting given that a new rating procedure for capture efficiency will likely be implemented within a year or two that would require the manufacturers to retest their models for airflow and sound ratings.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222857	3/5/2018
222857	John Rose (Home Ventilating Institute)	Sound Rating. HVI would like to point out that the definition of HVI's Working Speed rating ensures a minimum airflow, so products meeting the requirement for sound at Working Speed would also have an associated airflow rating. It is therefore not necessary to address airflow in the reference to minimum sound requirements.	Staff understands that sound level is affected by a fan's operating static pressure with higher static pressure corresponding to higher sound levels, and that working speed static pressure as defined by HVI 916 may be very low, sometimes as low as 0.01 inch wc. ASHRAE 62.2 specifies sound to be rated at 0.1 inch w.c. static pressure, thus staff understands that sound ratings at working speed according to HVI would not ensure sound performance of installed systems compliant with the 3 sone required by ASHRAE 62.2.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222857	3/5/2018
222857	John Rose (Home Ventilating Institute)	We support the enforcement of CEC Title 24, whereby raters can use the existing, readily available ratings in the HVI-Certified Products Directory to demonstrate compliance.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222857	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222858	Janet Ferrari (ConSol)	I request that the CEC staff please consider including HERS Verification of PV systems in the required list for new homes.	Staff finds that the required inclusion of direct reporting of panel output provides the necessary assurance of performance, given that it makes transparent the moment-to-moment operation of the panels and does so over the life of the system (as opposed to at a single point in time prior to occupancy). Staff additionally finds that cursory inspection of installed battery systems would be significantly less likely to identify issues affecting performance than the required automated reporting, and any observations highly likely to be redundant with the output of the automated reporting. (Staff notes that HERS raters would not be able to conduct any form of electrical testing of the system, and thus would be limited to a basic visual inspection to confirm that system elements exist.) Staff therefore does not find that requiring HERS verification would provide a benefit in excess of its cost.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222858	3/5/2018
222859	Brad Cochran (CPP Inc.)	Comment consists of an edited version of Section 140.9(c); edits are not indicated in the document and no rationale or justification for the differences from the Express Terms is provided. Substantive differences seem to be: 1. The watt per CFM limit is lowered to 0.6; 2. A "Simple Turndown" control option is added alongside the windspeed-based and contaminent-concentration-based options; 3. A sample rate is specified for in-situ sensing; 4. A provision is added for emission rates for chemicals that can not be detected with the in-situ sensors; and 5. A section specifying acceptance testing is added.	1. Staff has increased this limit to 0.85 watts per CFM for systems with air filtration, scrubbers, or other air treatment devices (based on other received comments) and retained the 0.65 watts per CFM limit for all other systems. Staff does not find that reducing these values without clear justification would be appropriate. 2. Staff finds that the "simple turndown" option is too vague to ensure energy savings: whereas the options in the Express Terms automatically reduce power use when sensors report that doing so is appropriate, the simple turndown option does not specify under which circumstances the equipment would automatically reduce its power use. Staff therefore does not find that adding this option would be appropriate. 3. Staff finds that no explanation or rationale is provided for the specified sample rate, and it is not clear that this rate would be an appropriate minimum sample rate. Staff therefore does not find that adding this minimum sample rate requirement would be appropriate. 4. Staff finds that the provision for non-detectable chemicals is too vague to function as a regulation: it is not clear how contaminents that cannot be detected would be automatically controlled by the exhaust system, or what form this control would take. Staff therefore does not find that adding this provision would be appropriate as it is not clear whether it would be technically feasible or cost effective. 5. Staff has added acceptance testing requirements, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222859	3/5/2018
222860	Kevin Messner (AHAM)	We have concerns with the building codes as they relate to ventilating hoods. There are three different airflow conditions (ASHRAE, HVI & ENERGY STAR) in various certifications of a range hood. These different airflow test conditions create undue burden for the manufacturer, suppliers, and home builders. Until this discrepancy is resolved between HVI and ASHRAE, the HVI data is not usable for verification actions. Without the HVI program, the verification process fails and the system will not meet its objective. The Industry is already in discussions on harmonizing HVI, ASHRAE, and ENERGY STAR test conditions to minimize burden and representative actual use conditions. AHAM recommends CEC provide additional time to resolve this matter.	Staff understands that for more than 10 years ASHRAE 62.2 has endeavored to solicit manufacturer compliance with the optional HVI rating points for airflow at 0.25 inch w.c. and sound at 0.1 inch w.c.. Energy Star has also worked to solicit manufacturer compliance with these ASHRAE 62.2 specifications for airflow and sound ratings. These rating requirements have been in force in Title 24 Part 6 since ASHRAE 62.2 was first adopted by reference with the 2008 Title 24 Standards update, but almost all manufacturers have failed to comply with the rating requirements, and staff has the understanding that building officials have not often enforced the rating requirements. The 2019 update to Title 24 has proposed a HERS verification of installed kitchen range hood ratings in an effort to further encourage manufacturers to comply. Staff provided relief from the burden of retesting to meet these rating points by proposing an exception to the 3 sone at 0.1 inch w.c. rating point required by ASHRAE 62.2, thus allowing existing sound ratings at "working speed" as defined by HVI 916 to be used for compliance. The result is that approximately 35% of the existing ratings for sound currently in the HVI directory will comply, and fans in the HVI directory rated for airflow at 0.1 inch w.c. (most of the fans in the HVI directory) will comply with the airflow rating requirement. Staff understands that indoor air quality is adversely affcted by cooking on kitchen ranges, and anticipates a new rating for kitchen range hoods for "capture Efficiency" is soon to be implemented by HVI which may require maufacturers to retest their models. Energy commission staff anticipate working to implement and enforce compliance with capture efficiency requirements in future updates to Title 24 to better protect public health.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222860	3/5/2018
222861	Kevin Messner (AHAM)	Cover page for TN 222860.	n/a	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222861	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222862	Calif. Retailers Association	Request that the Commission add exception to requirements of Section 130.2(a),(b),(c). Proposed exception: "Due to safety concern for the general public any nonresidential facility will be excused from these requirements based upon a CEC-approved number of parking spaces at the particular business location. The number of parking spaces that qualify for exemption shall be determined by the CEC based on the size and number at customers the nonresidential facility has during periods between sundown and sunup. However, nonresidential facilities that qualify for this Exception (1), may only be exempt from Section 130.2 in areas used by the general public for ingress and egress including parking areas primarily used by the general public during periods between sundown and sunup.	Staff notes that the requirements of Sections 130.2(a), (b), and (c) are not operational requirements: while the lighting and controls must be capable of the automatic behaviors specified in these Sections (and while a basic control scheme will be implemented during acceptance testing and left in place by the tester), once the structure is occupied the facilities operator is free to reconfigure the behavior of the lighting system in whichever ways are most appropriate for their needs (including specifying that specific lighting zones willl not automatically reduce lighting power). Staff therefore does not find that an exception is necessary to address the commenters concern.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222862	3/5/2018
222862	Calif. Retailers Association	The commenters stress the importance of safety considerations in setting of Title 24 requirements. "Statistics show that well-lit spaces are a major deterrent to crime, because proper illumination eliminates potential hiding spaces while increasing customers' awareness of their surroundings. The right lighting creates a sense of safety and watchfulness that those with criminal intent will find uninviting."	Staff notes that the requirements of Sections 130.2(a), (b), and (c) are not operational requirements: while the lighting and controls must permit the lighting to be reduced, facilities operators are free to determine the specific level of lighting that is most appropriate to their needs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222862	3/5/2018
222863	Pete Strasser (International Dark Sky Association)	The International Dark-Sky Association supports the decision to specify LEDs with a Correlated Color Temperature (CCT) of 3000 K or less, and to limit IES TM-15 Glare ratings to G2 or below.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222863	3/5/2018
222864	Michael Ivanovich (AMCA International)	Appears to be a duplicate of TN 222856.	Please see the responses noted for TN 222856	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222864	3/5/2018
222865	Erika Diamond (EnergyHub)	Regarding the proposed addition of Section 110.12, requiring OpenADR or SEP 1.1 and other demand response controls for residential home thermostats in Joint Appendix 5. These requirements not only create barriers for innovation and customer choice, but make current programs ineligible since they were built off of devices that do not currently have these capabilities, but successfu lly rely instead on OpenADR platforms to receive signals to dispatch individual devices. By mandating these changes, the Commission is making most current DR programs invalid unnecessarily, wasting ratepayer money and existing assets.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018
222865	Erika Diamond (EnergyHub)	Section 110.a.2: Section 110.a.2 also excludes z-wave when stating which demand response controls are allowed. The Commission should add z-wave, which is how many major device manufacturers communicate and is equal in capability. Recommended language: "All demand responsive controls shall be capable of using one or more of the following for communications that occur within the building: Wi-Fi, Zig Bee, BACnet, Ethernet, z-wave or hard-wiring."	Staff has added a provision to expressly state that additional protocols can be implemented by the device. Staff finds that inclusion of additional protocols to this list, such that a device is not required to include an IEEE standard communication protocol, would not be appropriate to implement as a response to a public comment and is best given a complete consideration as a code change proposal. Staff therefore invites the commenter to submit a code change proposal (including a complete explanation of the z-wave protocol) for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018
222865	Erika Diamond (EnergyHub)	Section 110.a.3: Section 110.a.3 should be removed as is inconsistent with how most devices work. In a DR event, devices are getting active server/cloud signals throughout the event and do not natively support DR events.	Staff notes that the requirements of this Section are existing requirements; with the exception of Demand Response, which is necessarily an ability to respond to an external signal, control functions must not be contingent upon external communications for their operation.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222865	Erika Diamond (EnergyHub)	The requirements in JA5 are also problematic and overly prescriptive. JA 5.2.4 and 5.2.6(b), in particular, mandate various demand response controls capabilities that are unnecessary for the device owner and disconnected from how most demand response programs work. Prescribing such capabilities, instead of results, ignores the fact that utilities, aggregators, and device manufacturers have already spent time and money on developing and maintaining the optimal set of functionalities for their customers and to enable DR.	Staff notes that the requirements in these sections are existing requirements, and that the only proposed change is a clarifying statement that the sections relate to minimum default behaviors. The requirements account for the circumstances described by the commenter: for example, JA5.2.6(b) states that "Unless an occupant has elected to connect the OCST to an energy management control system or service that provides for alternate strategies, the OCST shall provide a mode of operation whereby it controls temperature by following the scheduled temperature setpoints," underline added. Section 5.2.4 similarly states that it applies to the default behaviors of the DR device: the device is able to be configured into alternate modes. Staff does not find that fully removing minimum behavior specifications would be appropriate, as this would allow for devices that provide no functions to the occupant or utility to none the less qualify as demand response controls.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018
222865	Erika Diamond (EnergyHub)	The Commission should edit the following sections 5.2.4.: "a) A Demand Response Signal shall trigger the OCST to adjust the thermostat setpoint by either the default number of degrees or the number of degrees established by the occupant or the manager of the demand response program (the utility. device manufacturer or third party aggregator). b) When a price signal indicates a price in excess of a price threshold established by the occupant or the manager of the demand response program (the utility. device manufacturer or third party aggregator), the OCST shall adjust the thermostat setpoint by either the default number of degrees or the number of degrees established by the occupant or the manager of the demand response program (the utility. device manufacturer or third party aggregator). h) The OCST shall have the capability to allow occupants or the manager of the demand response program (the utility. device manufacturer or third party aggregator) to define setpoints for cooling and heating in response to price signals or Demand Response signals as an alternative to the default event response."	Staff finds that the added phrasing is unnecessary, given the specification that these requirements only apply to default device behavior: the specifications already allow the external communication described by the commenter. Staff therefore does not find that adding this phrasing would be appropriate, as it would only serve to eliminate any requirement for devices to have hardware defaults or be user-configurable.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018
222865	Erika Diamond (EnergyHub)	Sections JA 5.2.4(c) and 5.2.6(b) should be removed, since it is too prescriptive. After all, different programs require different actions - and very smart cloud platforms already take the thermal model of each house into consideration before dispatching a required offset to achieve the DR program goals. The occupant can always opt out of a demand response event if they wish, but it is unnecessary to prescribe the default settings for an OCST.	Staff finds that not all DR programs are "very smart", and that a default set of behaviors on the part of the on-site control device are necessary to ensure a bare minimum ability to participate in a variety of DR programs and ensure "out of the box" operational ability. Staff therefore does not find that removing these requirements would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222865	3/5/2018
222866	Pete Strasser (International Dark Sky Association)	Duplicate of TN 222863.	See responses for TN 222863	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222863	3/5/2018
222867	Michael Fischer (ARMA)	The Asphalt Roofing Manufacturers Association (ARMA) supports the proposed modification to define low-slope roofs less than 2:12. This change will correlate with building standards for both low and steep slope roofing systems in the California Building Code roofing provisions.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222867	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222868	Tony Koch (Bonnevill Power Administration)	Title 24, Part 6, Section 110.12 (a): An area of concern is for a manufacturer to use a proprietary application layer at the demand responsive device and translate it into an "open" protocol in the manufacturer's cloud. This configuration does not suggest a wholly "open" communication network, but, rather, relies on the manufacturer's proprietary application access and translation. That is why we suggest that the language proposed be changed to ensure the demand response communication protocol is an open standard communication protocol, like CTA-2045-A, physically located at the demand responsive device. The NRDC 45-Day Language Hearing comments correct this problem and further specify a number of other important details that must be addressed to have open communication at the device.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222868	3/5/2018
222868	Tony Koch (Bonnevill Power Administration)	We endorse the NRDC Comments on the 2019 Building Energy Efficiency Standards 45-Day Language Lead Commissioner Hearing ("NRDC 45-Day Language Hearing Comments"). The NRDC specification is robust and suggests important requirements that will have a significant impact on decarbonization efforts. BPA would particularly like to ensure the language covered in the NRDC 45-Day Language Hearing Comments § 3.2 (a)-(b) is implemented as-is. (see pages 3-4 for language)	Please see the responses noted for TN 222624	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222868	3/5/2018
222869	Stephen Wieroniey (American Chemistry Council, Spray Foam Coalition)	SFC requests that the following exception be added to the California Energy Code Title 24 Part 6 Residential provisions: Duct testing for air leakage is not required where the ducts and air handlers are located entirely within the building thermal envelope and air barrier. As the CEC strives to promote the use of high-performance attic design in residential construction, applying this exception will provide builders with an added incentive to place the ducts in conditioned space. In order to ensure proper performance, the proposed provision includes the requirement that the ducts be located within the air barrier for the exception to apply.	Staff finds that from a system performance perspective, the issue is that if ductwork is leaking inside the thermal envelope then airflow is reduced to the supply registers in the occupied space. Any unaccounted leakage outside of the occupied area will impact the mechanical system by reducing the total airflow and therefore some part of the system will not be able to meet its designed cubic foot per minute airflow. Consequently, even ducts located inside the occupied area need to be sealed: for example, if a duct is leaking in the family area and that duct also supplies a couple of bedrooms, then the bedrooms will not be getting sufficient air supply to properly condition those spaces. Staff therefore finds that implementing the commenter's suggestion would not be appropriate, as it would create a myriad of situations that would delay approval of systems through the HERS approval process and potentially create problems in mechanical distribution systems. Residential mechanical distribution systems are laid out as a complete system. As a result, ductwork that will be included inside the thermal envelope would have to be detached or plugged. Then after the leakage test the system would have to be unplugged or attached - opening the possibility of new leaks or even left plugged after testing.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222869	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	Alternatively, if the CEC desires to not make this modification to the 45-day language, and continues to call for adiabatic condensers to be tested in the dry mode, then the language should clearly state that the adiabatic pads should be removed during dry mode testing. This will place adiabatic designs more on par with air cooled condensers.	Staff finds that "worst case" testing of these units in dry mode and with pads in place is appropriate given that they will be operated in dry mode during a significant fraction of the year, and that operators are unlikely to remove the pads when operating the equipment in dry mode.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	CTI Standard 201 also needs to be updated in Section 100.1 and in Appendix 1-A (see pages 4-5 for language)	Staff has updated this reference, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	TC 8.6 also are pleased that the latest analysis by the CEC Consultant supports a prescriptive minimum efficiency of 60 gpm/hp (except in two climate zones) for axial fan, open circuit cooling towers used in water cooled chiller systems over 300 tons, along with no increase in the current mandatory minimum efficiency of 42.1 gpm/hp.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	TC 8.6 also supports the harmonization of the minimum efficiency for axial fan closed circuit cooling towers with the value in Standard 90.1 – 2016 (16.1 gpm/hp).	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018

2019 Building Energy Efficiency Standards Response to Comments Matrix
45-Day Comment Period

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	TC 8.6 appreciates the language in the 45-day draft of Title 24 2019 relative to evaporative heat rejection, including removal of the tighter approach requirements for waterside economizers, strengthening of the air cooled chiller limitation, and inclusion of clarifying language in the Code for the prescriptive requirement for open circuit cooling tower efficiency.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	The CEC has proposed acceptance testing in the dry mode only using an air cooled condenser test standard (as there is currently not a test standard specifically for adiabatic condensers). As these units are designed for wet operation, which is where they save the maximum energy, we strongly suggest that adiabatic condensers be tested in the wet (adiabatic) mode.	Staff finds that "worst case" testing of these units in dry mode and with pads in place is appropriate given that they will be operated in dry mode during a significant fraction of the year, and that operators are unlikely to remove the pads when operating the equipment in dry mode.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222870	Frank Morrison (ASHRAE TC 8.6 Codes and Standards Subcommittee)	We do have concerns with the proposed Code language in Tables 120.6-B and 120.6-C, which establish a method of minimum sizing for adiabatic condensers based exclusively on the dry bulb and the dry heat rejection efficiency. We firmly believe that the minimum sizing criteria for the equipment should be based on the adiabatic (wet) operating conditions, with the saturated condensing temperature at or below the ambient dry bulb temperature	Staff finds that the equipment must be sized such that it can provide all needed capacity while operated in the dry mode, given that it will need to be operated exclusively in this mode for some fraction of the year. Staff does not find that amending the language to permit equipment that will be undersized when operated in its dry mode to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222870	3/5/2018
222871	California Energy Alliance	The California Energy Alliance (CEA) would like to express its support of the use of ANSI-accredited certified commissioning professionals on regulated, nonresidential projects exceeding 50,000 square feet in size or that contain a complex mechanical system, as put forth by the California chapter of the Building Commissioning Association.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222871	3/5/2018
222872	Joshua Greene (AO Smith)	A. O. Smith continues to be puzzled by Commission's continued actions to structure its building codes to advantage a specific technology that is manufactured overseas, while placing domestic manufacturers at a disadvantage.	Staff finds that the commenter's assertion that the Part 6 provisions advantage specific technology overseas is unfounded, and it leaves unclear why instantanous water heaters cannot be manufactured domestically. The standards are drafted to be as technology neutral as possible while ensuring that feasible and cost effective energy savings is achieved; staff additionally note that buildings built using the performance approach to technology are not required to follow the prescriptive options.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	AO Smith has maintained a fundamental position that the customer should make the ultimate decision on what type of water heating system is appropriate for their circumstances as opposed to regulations making that choice for them.	Staff finds that the different prescriptive options for gas water heater provides the same level of performance for the water heating system, and provide for gas storage, gas instantaneous, and heat pump storage; staff has added an additional option for gas storage to ensure all sizes of equipment are accounted for. In addition, the performance approach to compliance allows the specification of any equipment. Staff therefore finds that the proposed Express Terms provide for customer choice, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Demand Response – Section 110.12(a): A. O. Smith supports the Commission's recommendation on demand response and load management.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Demand Response – Section 110.12(a): A. O. Smith urges the Commission to ensure that in any ensuing final amendments that a technology neutral approach is taken regarding communication protocols for connected devices and appliances. While this may, and certainly should, include OpenADR 2.0(a) and (b), it should also include protocols like CTA-2045, which is being implemented by manufacturers, utility partners, and third-party aggregators.	Staff has added a prescriptive option for replacement heat pump water heaters that specifies compliance with NEEA Tier 3, inclusive of its optional CTA-2045 specification. That said, staff finds that more information on CTA-2045 would need to be included in the public record in order to consider the specification, and whether any further amendment or specification would be necessary to apply to the standard. Staff therefore finds that it would not be appropriate to specify CTA-2045 as a response to a public comment and that it is best given a complete consideration as a code change proposal. Staff therefore invites the commenter to submit a code change proposal (including a complete explanation of the CTA-2045 protocol) for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Demand Response – Section 110.12(a): A. O. Smith urges the Commission to more clearly delineate which buildings are covered under the requirement.	Section 110.12 is applicable to all buildings save for healthcare facilities. Section 110.12(a), (b), and (d) place no further stipulation; Section 110.12(c) is additionally applicable only to buildings over 10,000 square feet. Staff is not able to determine a more clear wording for the applicability of these provisions than is present in the Express Terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018

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222872	Joshua Greene (AO Smith)	Demand Response – Section 110.12(a): Consistent with the comments submitted by NRDC on grid-interactive electric water heating for load management, it becomes more imperative that the Commission clarify the scope, technology, and applicability of Section 110.12, which would go a long way in providing manufacturers business certainty in relation to their product's technology offerings in the California market.	Staff has made several clarifying changes to this Section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	In general A. O. Smith is pleased to see that the Commission is, with its proposed amendments to the 2019 edition of Title 24, Part 6, embracing a more technology neutral approach as it relates to domestic water heating.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Mandatory Features and Devices – Section 150.0(j)(1)-(2)(A)(i-iii): A. O. Smith notes that the California Plumbing Code already requires piping insulation and therefore the Commission's proposal may well conflict with those provisions.	Staff's revisions to this Section are intended to align with the Plumbing Code, and apply higher minimum insulation requirements in the specified conditions. Staff has made further amendments to the language with the goal of alignment in mind; staff finds that the final language does not conflict with the Plumbing Code and is in this way consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Mandatory Features and Devices – Section 150.0(j)(1)-(2)(A)(i-iii): Making piping insulation of a certain size/thickness and lengths may have the effect of adding additional installation costs in excess of the minimal efficiency gain as well as slowing the delivery of new housing units when storage tank water heaters are utilized.	Staff finds that pipe insulation is already a mandatory requirement for both Part 6 and Part 5. The insulation thickness requirement has been inplace since 2013 and has been shown to be cost effective, per the prior rulemaking under which it was adopted. Staff does not find evidence that the need to insulate hot water piping is likely to "slow the delivery of new housing".	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Mandatory Features and Devices – Section 150.0(n)(1)(A): A. O. Smith is supportive of clarifying that a dedicated outlet be installed closer to the water heater.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Mandatory Features and Devices – Section 150.0(n)(1)(D): While the requirement to install a gas supply line with a capacity of at least 200,000 Btu/hr is not a new requirement under the 2019 amendments, the provision is yet another example of a requirement that on its face advantages the installation of gas tankless water heaters. California's building code should not continue to force all homeowners to subsidize the costs of installing a 200,000 Btu/hr gas supply line in homes.	Staff notes that no change is proposed in the Express Terms for this provision. None the less, staff finds that this requirement allows customers to decide whether they want a storage gas, condensing storage gas or instantaneous gas water heater as a replacement, consistent with technology neutrality and with the proposed parallel requirement to include a receptacle suitable for use by an electric heat pump water heater. The cost of using a 3/4 inch gas line in place of a 1/2 inch line during new construction is about $76, which is less than 1/10 the cost of retrofitting a larger gas line and ensures compatibility with all potetial gas equipment options. Staff additionally finds that this approach is consistent with the A.O. Smith request that the homeowner be in position to decide on what type of water heating system is appropriate for their circumstances, as opposed to being limited by decisions made by the builder prior to sale.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Performance Requirements – Section 150.1(b)(1) and Thermal Storage: A. O. Smith strongly recommends that the Commission adopt an incentive program that values thermal energy storage programs that utilize grid-interactive water heaters.	Staff finds that incentive programs are outside the scope of Part 6 and therefore outside of the scope of this rulemaking. That said, staff will continue to advocate for supporting incentive programs as part of their normal interactions with CPUC program participants.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Performance Requirements – Section 150.1(b)(1) and Thermal Storage: While A. O. Smith agrees with commenter Air-Conditioning, Heating, and Refrigeration Institute ("AHRI") that thermal storage systems should receive parity with battery storage systems, A. O. Smith encourages the Commission to adopt a proposed specification for the utilization of grid-interactive electric water heating for load management to the 2019 amendments as outlined by commenter National Resources Defense Council ("NRDC").	Staff notes that the comment appears to relate to the Energy Commission's compliance software and not to changes proposed in the Express Terms. None the less, staff finds that batteries are more effective at load shifting than water heaters as they are potentially useful in affecting the entire load of the house (including HVAC, lighting, water heating, and plug loads); this larger effect necessarily creates a larger credit in the software. Other load shifting strategies, such as thermal storage, thermal mass, precooling, and smart thermostats can only affect one load and not the plug loads or the entire house load, meaning that modeled energy impacts (and derived compliance credits) will be smaller. To the extent that the commenter is recommending that additional credit above modeled impact be assigned to this equipment, staff finds that artificially inflating the credit for these other strategies beyond their modeled impact on overall energy use would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(i, iii, and iv): A. O. Smith generally supports the Commission's inclusion of electric heat pump water heaters ("HPWH") as an alternative compliance option.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018

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222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(i, iii, and iv): A. O. Smith is not certain, however, in the legality of requiring the pairing of those products (HPWHs) with solar PV systems in newly constructed low-rise buildings.	Staff does not find that the PV requirement violates federal preemption requirements. That said, staff has added an option that is not reliant on additional solar capacity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(i, iii, and iv): Considering the Commission's proposed amendment requiring that "all low-rise residential buildings shall have a photovoltaic (PV) system meeting the minimum qualification requirements as specified in Joint Appendix JA11, with annual electrical output equal to the dwelling's annual electrical usage" (See 150.1(14)), A. O. Smith is unclear why the Commission would require that a HPWH be tied to a solar PV system in certain Climate Zones. A. O. Smith recommends the Commission eliminate the pairing requirement for HPWHs and solar PV systems in all Climate Zones.	The PV requirement in 150.1(c)14 is based on the annual electricity load of a mixed fuel home with gas water heater. The additional PV requirement for HPWH is to offset a portion of the additional electricity load from the HPWH, in line with the objective of offsetting the electricity load of the dwelling. The additional PV requirement is different based on climate zone is because HPWH performs differently depending on ambient temperature. That said, staff has added an option for PWH that is not dependent on solar photovoltaics (thus meaning that pairing is no longer required for prescriptive compliance), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(i, iii, and iv): In addition, A. O. Smith is unclear why the requirement is also modified by the word "single" when in the amendment to 8(A)(i) the Commission modifies /contemplates "One or more" tankless water heaters. For certain homes a consumer may want and/or need to have one or more HPWHs or high efficiency storage tank type water heaters. This is another example of the Commission sending a market signal through the building code that advances the interest of one technology over another. A. O. Smith recommends the Commission provide parity to storage tank type water heaters (e.g. add "One or more" for storage water heaters or eliminate the modifier entirely).	Staff notes that the prescriptive storage options are based on the assumption that one water heater will be installed in the dwelling, consistent with the most common design circumstance. Staff finds that storage water heaters necessarily have standby losses, meaning that any additional storage water heaters will increase the total standby loss of the water heating system and therefore that system's total energy use. For this reason, specification of additional storage water heaters would serve to increase the energy use of the standard design building in a manner inconsistent with the purpose of the prescriptive compliance options. Additional storage water heater can be accurately modeled (and their associated marginal energy use accounted for) under the performance method, allowing their installation. (Staff notes that this issue is not applicable to additional instantaneous water heaters: instantaneous water heaters do not have standby losses, therefore installation of additional instantaneous water heaters can be assumed not to increase the total water heating load or energy use of the dwelling.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(i, iii, and iv): Requiring that an installer pair it with a solar PV system would serve as a deterrent to builders sensitive to cost. A. O. Smith believes that the pairing of the solar PV requirement sends the wrong signal to the marketplace about the benefit of heat pump water heaters and again, takes choice out of the hands of builders, installers, and consumers to select from alternative technologies, all of which address the Commission's objectives.	Staff notes that the PV requirement in 150.1(c)14 is based on the annual electricity load of a mixed fuel home with gas water heater: the additional PV requirement for HPWH is to offset a portion of the additional electricity load from the HPWH, in line with the objective of offsetting the electricity load of the dwelling. That said, staff has added an option that is not reliant on additional solar capacity, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): A. O. Smith recommends Commission remove the DHWR system as a compliance option in the 2019 amendments.	Staff finds that providing DWHR as an optional alternative to the use of a compact distribution system is consistent with recognizing the benefit that can be provided by these devices and of providing additional options to builders where equivalent performance can be demonstrated. Staff therefore does not find that removing this option would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): Pursuant to the comments submitted by the Bradford-White Corporation as well as AHRI, A. O. Smith does not support the Commission's proposal to eliminate from commerce in the State of California, gas or propane storage water heaters with inputs of 105,000 Btu per hour or less and rated storage volumes of less than 55 gallons.	Staff notes that this class of product is not banned, and can be modeled and installed under the performance standard; a lack of prescriptive compliance option for a device is not a prohibition of said device. That said, staff has added a prescriptive option to account for all sizes (i.e., gallon capacities) of water heaters. (Staff notes that the btu per hour rating specified in the Express Terms is consistent with federal definitions for this equipment, and therefore finds that changing the btu per hour specification would not be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): The amendment's option regarding hot water piping insulation is equally curious given the Commission's proposal under Section 150.0(j) regarding all piping insulation on cold water (from a storage tank) and hot water lines. If insulation is required why is this an option under (ii)?	Staff notes that the distinction is that the insulation be HERS verified after it is installed. That said, staff has removed this option consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018

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222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): The CASE Report addresses a number of potential impediments to the DWHR technology's adoption least of which is ensuring that the State's "greywater" regulations are harmonized with the proposed DWHR proposal and that statewide energy savings on the proposal were not calculated.	Staff notes that the inclusion of DWHR as a non-mandatory prescriptive option is intended, in part, to account for the fact that it is not appropriate in all circumstances. Staff fully intends for installers to use this option only when DWHR makes sense for their projects and to otherwise choose a different prescriptive option.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): Under the proposed amendment, storage tank water heaters would have additional installation requirements whereas tankless water heaters would not. As the Commission knows, compact hot water distribution systems, as defined in the Reference Appendix, have a bias toward point-of-use (i.e. tankless) hot water solutions given piping length restrictions. While a builder could certainly design a compact system that utilizes a storage tank water heater – and some may – taken together with other elements of Title 24 what incentive(s) do they have to do so?	Staff finds that compact distribution is generally achievable for central systems, and notes that the inclusion of alternate options such as DWHR exist to support those circumstances where it is challenging. Staff notes that the prescriptive compliance path is used for the majority of low-rise residential buildings, and that the prescriptive options are developed based on where equivalent performance is able to be demonstrated in our compliance software. Staff additionally notes that use of a water heater performing above the federal minimum appliance standard is often sufficient for the product to be installed; compact design would not be needed in this case. Staff therefore finds that ample ability to install storage water heaters is provided in the Express Terms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.1(c)8.A(ii): While the Commission rests its justification for this amendment on the Quality Insulation Installation (QII) requirement for all new low-rise buildings, that in no way justifies the prohibition of selling a certain category of water heating equipment that is compliant with federal law. A. O. Smith recommends the Commission simply eliminate the gallon size restriction.	Staff notes that this class of product is not banned, and can be modeled and installed under the performance standard; a lack of prescriptive compliance option for a device is not a prohibition of said device. Additionally, Title 24 Part 6 does not apply to the sale of products - it is possible that the commenter is confusing the application of Title 24 building efficiency standards with Title 20 appliance efficiency standards. Staff notes that the gallon size "breakpoint" is needed because of the different federal standards that apply to water heaters in the under 55 gallon class and over 55 gallon class. That said, staff has added a prescriptive option to account for all sizes (i.e., gallon capacities) of water heaters, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.2(b)(1).H: Consistent with A. O. Smith's comments above, as well as commenter AHRI, A. O. Smith recommends that the Commission decouple the HPWH solar PV system requirements.	Staff has added an option to install a heat pump water heater that is not reliant on solar PV, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	Prescriptive Requirements – Section 150.2(b)(1)H.(iii)(d): While A. O. Smith infers from the amendment's use of the modifier "only" that electric resistance storage type grid-enabled water heaters would be allowed under the amendment, A. O. Smith recommends that the Commission seek to clarify this by simply referencing the applicable federal law covering these products.	Staff has edited this section to improve clarity and intent; staff has removed the sentenace that reference the volume limit of 60 gallons, and added language to clarifty only consumer water heaters (not commercial water heaters) comply with this section (other water heaters may be installed using the performance approach to compliance). Staff does not find that reference to federal law would help to improve the clarity and readability of this section, particularly to the layperson.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222872	Joshua Greene (AO Smith)	The proposals addressing domestic water heating continues a pattern from the Commission that advantages the utilization of tankless and/or compact distribution water heating systems over storage tank technology of equal or greater efficiency.	Staff notes that the prescriptive compliance approach does not advantage any particular water heating solution: the Energy Commission modeling software provides an accurate model of anticipated energy use, and provides appropriate accounting for system efficiency (including the use of models with better-than-federal-minimum efficiency). Staff then develops prescriptive options based on this modeling, with the constraint of needing to avoid options that are inconsistent with federal preemption requirements. Staff does not find any pattern of advantaging or disadvantaging a technology for its own sake, and instead finds that the pattern of Part 6 has been to attempt to accommodate as many approaches to building design and efficiency as possible (including consideration of entirely new approaches and innovative technologies under Part 1 Section 10-109).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222872	3/5/2018
222873	Eva Greene (Whirlpool Corporation)	Kitchen Range Hoods: The HVI directory does not contain ventilation hood ratings at the 0.25" w.c. As a result, consumers, builders and inspectors would not have available data from which to verify the performance of tested kitchen range hoods.	Staff has added an exception stating that "Kitchen range hoods may be rated for sound at a static pressure determined at working speed as specified in HVI 916 section 7.2", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222873	3/5/2018

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222873	Eva Greene (Whirlpool Corporation)	Kitchen Range Hoods: Variations in airflow test conditions between ASHRAE 62.2, HVI and ENERGY STAR® (see Figure 1 below) have created significant challenges and inefficiencies in defining the performance conditions for kitchen range hoods. Before the Energy Commission proceeds with changes to requirements for ventilation hoods, it is critical for HVI and ASHRAE to resolve these variations to ensure a functional verification process and to avoid complexity and unnecessary costs for businesses and consumers.	Staff understands that for more than 10 years ASHRAE 62.2 has endeavored to solicit manufacturer compliance with the optional HVI rating points for airflow at 0.25 inch w.c. and sound at 0.1 inch w.c.. Energy Star has also worked to solicit manufacturer compliance with these ASHRAE 62.2 specifications for airflow and sound ratings. These rating requirements have been in force in Title 24 Part 6 since ASHRAE 62.2 was first adopted by reference with the 2008 Title 24 Standards update, but almost all manufacturers have failed to comply with the rating requirements, and staff has the understanding that building officials have not often enforced the rating requirements. The 2019 update to Title 24 has proposed a HERS verification of installed kitchen range hood ratings in an effort to further encourage manufacturers to comply. Staff provided relief from the burden of retesting to meet these rating points by proposing an exception to the 3 sone at 0.1 inch w.c. rating point required by ASHRAE 62.2, thus allowing existing sound ratings at "working speed" as defined by HVI 916 to be used for compliance. The result is that approximately 35% of the existing ratings for sound currently in the HVI directory will comply, and fans in the HVI directory rated for airflow at 0.1 inch w.c. (most of the fans in the HVI directory) will comply with the airflow rating requirement. Staff understands that indoor air quality is adversely affcted by cooking on kitchen ranges, and anticipates a new rating for kitchen range hoods for "capture Efficiency" is soon to be implemented by HVI which may require maufacturers to retest their models. Energy commission staff anticipate working to implement and enforce compliance with capture efficiency requirements in future updates to Title 24 to better protect public health.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222873	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Exception 2 to Table 120.3: Buildings are generally kept between 65 and 75F if they are being conditioned. So 5F less won't create much heat loss, but 30F above will. I recommend that 105F be changed to 80 or 85F.	Staff finds that the recommended change conflicts with ASHRAE 90.1, and is provided without any substantiating data or analysis. Staff additionally notes that pipe insulation requirements are not specific to conditioned space and apply to piping in unconditoned spaces. Staff therefore invites the commenter to submit a complete code change proposal that fully describes the justification and likely impacts of the proposed change.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Exception 3 to Table 120.3: Isn't this clause trying to say the same thing as Exception 2? If so, this can only happen if the delta-T is small, as my proposed change would be. Either combine these into one clause, or eliminate one of them.	Staff finds that there are differences in application of the two Exceptions, and that the clearer, plainer language of Exception 3 is preferable where applicable. Staff therefore finds that eliminating the exception would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Exceptions to Section 150.0(j)2: My proposal is to combine the two exceptions into one. It was incorrect to delete where the pipes must be located within the wall; they should be located closer to the conditioned space that to the unconditioned space. I have added floors because the pipe could be installed there too. I believe that this rewording is a better way to cover the four locations. (see language pages 6-7)	Staff finds that Exceptions 3 and 4 are significantly different: the former is based on successful performance of a procedure, and the latter based solely on the ability of the noted insulation to provide the same thermal benefit as dedicated pipe insulation. Staff therefore does not find that merging these exceptions would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	RA3.6.2 HERS-Verified Pipe Insulation Requirements for all Hot Water Distribution Systems: This section should be written to reflect all of the changes made to the body of the code where the language is identical. Alternatively, it could simply refer to the relevant code sections. One way or the other additional language that describes how to meet the requirements of the code can also be included.	Staff finds that the appropriate location for descriptions of how to meet the requirements of code is the Compliance Manuals. Staff additionally finds that the language in the Express Terms for the Residential Appendix reflects the Express Terms for Part 6, noting that most of the edits to Part 6 were nonsubstantive and clarifying in nature; the commenter does not identify a discrepancy for which correction would be appropriate. Staff therefore finds that adding or revising this language in the manner suggested by the commenter would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	RA3.6.3 HERS-Verified Pipe Insulation Credit (PIC-H): This section should be kept in place for at least 2 or 3 code cycles so that the industry can learn what is meant by proper installation of hot water pipe insulation. Please note that the remaining paragraph refers to section RA4.4.3 Pipe Insulation Credit, which is shown as being deleted.	Staff has removed the reference to RA4.4.3, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	RA3.6.4 HERS-Verified Central Parallel Piping (PP-H): This clause no longer seems correct since all hot water piping must be insulated. In addition, it is not only parallel piping systems that can have long runs of hot and cold water piping running next to each other for long distances, so if we want to say this, we should say it for all domestic hot and cold water systems. (see language page 7)	Staff finds that the clause require the HERS inspector to verify proper installation of pipe insulation, which it is in addition to simply having said mandatory pipe insulation. While it is true that all system should have shorter pipes, this verification is specific to this compliance credit	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018

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222874	Gary Klein (Gary Klein and Associates, Inc.)	RA3.6.9 HERS-Verified Drain Water Heat Recovery System (DWHR-H): There is potential problem with the wording in (e). Being within 2 degrees of the rated slope is a reasonable tolerance for vertical DWHR units. At the other extreme, a low slope (horizontal) drain is typically installed at a 2-degree slope with some exceptions that allow for a 1-degree slope. In addition, horizontal DWHR can slope in two directions – along their length and side to side. While this is probably covered in (f), given that this is a brand new component, I recommend that we make the tolerance both tighter and more clear here. The new wording is taken from IGC346. (see language page 8)	Staff has added language to allow and account for slope, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	RA4.4.1 Proper Installation of Pipe Insulation: This section should be written to reflect all of the changes made to the body of the code where the language is identical. It also seems to need to be identical to Section RA3.6.2. Alternatively, it could simply refer to the relevant code sections or to RA3.6.2. One way or the other additional language that describes how to meet the requirements of the code can also be included.	Staff finds that the appropriate location for descriptions of how to meet the requirements of code is the Compliance Manuals. Staff additionally finds that the language in the Express Terms for the Residential Appendix reflects the Express Terms for Part 6, noting that most of the edits to Part 6 were nonsubstantive and clarifying in nature; the commenter does not identify a discrepancy for which correction would be appropriate. Staff therefore finds that adding or revising this language in the manner suggested by the commenter would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 110.3 (c)2. Is the intent to exempt health care from only the controls requirement for hot water distribution systems? Should there be other exemptions?	Other needs (and justifications) for exception to this Section have not been identified to staff.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 110.3(c)3: My recommendation is to delete this section and let it be handled by the CPC, as this issue is primarily one of health and safety, not energy (particularly since the proposal is to raise the temperature). Please see Section 407.3 of the CPC.	Staff has removed this Section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 110.3(c)4: A and B should be combined into one clause.	Staff finds that the current separation helps to more clearly convey that a unit using solely external insulation has one target, while units using a combination of internal and external insulation have a higher target. Staff therefore does not find that merging these exceptions would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 110.3(c)4: Why do we allow an R-12 external jacket and require combined internal and external insulation of R-16 for the same tank?	Staff finds that the R-12 requirement presumes that an unknown, non-zero amount of internal insulation is likely to exist; even a glass interlayer provides some amount of thermal benefit. This provision could be restated as "If internal insulation values are not known, presume an amount of benefit equivalent to R-4 and apply an additional R-12 of external insulation".	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(a): In addition, there seems to be a logic problem with what is connected to fluid distribution systems for space heating or cooling. The elements that are not in series act as thermal wicks taking energy away or adding it to the fluid distribution system. They are no different than the cold water piping is to a hot water storage tank. If the fluid distribution piping is required to be insulated, so too should be the elements that are not in series. (see page 4 for language)	The commenter might be refering to strainers, control valves, and balancing valves. For piping under one inch in diameter, these are not currently required by Part 6 or by ASHRAE to be insulated, meaning that a requirement to insulate these elements would represent a new requirement with an associated marginal cost. Staff therefore invites the commenter to submit a complete code change proposal that includes the costs and benefits of insulating these elements for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(a): This section is about pipe insulation, which is now required by the CPC for service hot water piping in all occupancies. Since it is required on all such piping, it would seem that some of the section is no longer needed.	Staff notes that the CPC requirement and the existing Part 6 pipe insulation requirement are slightly different, generally in relation to insulation of pipes less than one inch in diameter, and also that CPC requirements do not apply to as many circumstances as this Section. Staff does not find that reducing adopted insulation requirements found to be feasible and cost effective would be appropriate. That said, staff has edited Section 150.0(j)2 to make clear that the CPC should be followed where it applies, and that Part 6 applies only a marginal increase in minimum insulation in specific, noted cases.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(b)2: What is meant by adhesive tape? What is meant by “provide this protection?”	Staff notes that similar language exisit in 90.1 to prohibit adhesive tape as protection. Staff finds that "adhesive tape" is being used in a manner consistent with the ordinary meaning of the phrase, and thus that a specific definition is not necessary. "This protection" refers to the protection required by this section, noting that the section's title is "Insulation Protection".	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(c) Insulation Thickness What was the purpose of adding R-values to the table?	The addition of R-values were requested by commenters and will add flexibility to installers. Staff finds that the R-values are equivalent to the insulation thickness and do not change the existing requirements, and therefore that adding these values to be responsive to the request for transparency and flexibility was appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018

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222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(c) Insulation Thickness: As far as hot water systems goes, there are two rows that are applicable. What if I pick the row with the lower values and then the system is operated in the higher temperature range?	Staff notes that the requirement clearly states the pipe insulation is based on operating temperature.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(c) Insulation Thickness: Energy Commission should communicate with the major pipe insulation suppliers to explain the rules for California and ask them to stock the appropriate wall thicknesses.	Staff does not find any evidence of a shortage of pipe insulation in California, and notes that the addition of R-value is likely to assist in communicating, ordering, and stocking appropriate products.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(c) Insulation Thickness: My recommendation is to take Service Hot Water out of the table entirely and defer to the insulation rules in the CPC. Delete the words twice in the title. ASHRAE really developed the table for use in space conditioning anyway, so let the table remain for space conditioning piping.	Staff notes that the CPC requirement and the existing Part 6 pipe insulation requirement are slightly different, generally in relation to insulation of pipes less than one inch in diameter. Staff does not find that reducing adopted insulation requirements found to be feasible and cost effective would be appropriate. That said, staff has edited Section 150.0(j)2 to make clear that the CPC should be followed where it applies, and that Part 6 applies only a marginal increase in minimum insulation in specific, noted cases.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 120.3(c) Insulation Thickness: The energy code can assist the plumbing inspectors by still providing credit for insulation that has been inspected and verified by a HERS rater. Continue this inspection for at least two or three code cycles so that everyone learns what is meant by proper installation.	Staff notes that the HERS verified pipe insulation credit is unchanged for 2019, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 150.0(j)1: Why do we allow an R-12 jacket and require R-16 internal insulation for the same tank? Since most water heaters now have R-16 internal insulation my recommendation is to change the paragraph to read …"in installed thermal resistance of R-12 R-16 or greater or have…	Staff notes that the intent of these requirements is to provide options when the internal insulation is unknown and not in conflict with each other; this appears consistent with the commenter's suggestion, and staff finds that because the intent is to account for situations where some values may not be known, additional specificity may act to make the section less useful for its purpose.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 150.0(j)2.A: Keep the first sentence referring to the CPC. Delete ii.-B. Keep the new B. I like how i. has eliminated the hot water piping from the clause. This is correct per the CPC. In fact, it would make sense to follow this same pattern for Section 120.3(a)3. Service water heating systems. (see language page 6)	Staff notes that the CPC requirement and the existing Part 6 pipe insulation requirement are slightly different, generally in relation to insulation of pipes less than one inch in diameter. Staff does not find that reducing adopted insulation requirements found to be feasible and cost effective would be appropriate. That said, staff has edited Section 150.0(j)2 to make clear that the CPC should be followed where it applies, and that Part 6 applies only a marginal increase in minimum insulation in specific, noted cases.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Section 150.0(j)3: This referral to another section is an excellent idea. There are several other sections in which the same language was repeated, but without exactlythe same wording, which will only cause confusion. Get it worded correctly once, then refer people to that section.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222874	Gary Klein (Gary Klein and Associates, Inc.)	Sections RA4.4.14-21: All of these sections are about verifying installation through a HERS inspection; they seem out of place. Appendix RA3 is about Residential Field Verification and Diagnostic Test Protocols. Appendix RA4 is about the Eligibility Criteria for Energy Efficiency Measures. It seems to me that the description of how to do the verification belongs in RA3 and the measure criteria belong in RA4. The text of each paired section should be similar but not identical. Also, the headings for each section should not be identical, which they are in several cases.	Staff finds that the suggested reorganization of the langauge does not materially change the intent of the langauge but risks affecting stakeholders that are already familiar with these sections and are not anticipating any change. Staff therefore finds that this is most appropriate as a code change proposal for 2022, in order to give an appropriate amount of time for affected stakeholders to consider and discuss.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222874	3/5/2018
222875	Jonathan Houle (ecobee)	Allowing other third parties access to the device could compromise ecobee's customer promise by relinquishing the control of those features over to other entities. Where a device is configured to only connect to one VTN, this could prevent customers from enrolling into programs offered by multiple utilities for different fuel types in the future.		https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222875	Jonathan Houle (ecobee)	ecobee believes that 110.12(a) should be refined to target specific systems or technology types where the CEC has specific concerns around stranded assets and not be broadly applied to all demand responsive controls and building types.	Staff finds that the topics addressed in Section 110.12(a) are broadly applicable to demand responsive controls generally, and does not find that the risk of stranding is in any way unique to controls of one or another specific type of equipment.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018

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222875	Jonathan Houle (ecobee)	ecobee strongly believes that requiring all DR enabled devices to be OpenADR enabled is likely to lead to poor customer experience and ultimately compromise ecobee's customer value proposition as well as stifle future innovations to further optimize energy consumption in the home. We believe that our requiring cloud-based OpenADR certified VTN is the appropriate response to enable the CEC's goal of streamlining the protocols used in market to perform DR events.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222875	Jonathan Houle (ecobee)	In reviewing 110.12(a) and other sections applied to Non-Residential Buildings, it appears that lighting controls will need to be 1) OpenADR certified and 2) capable of dimming as a means of responding to DR events where a certain W/sq.ft. threshold is met. While it appears this Code change is aimed at common area lighting systems, it is possible that it could impact in-suite lighting controls as well. ecobee sees potential issues with requiring OpenADR on light switches and the use of dimming as a response to a DR signal in MURB suites. ecobee would be pleased to discuss the potential impacts of requiring OpenADR on residential lighting controls with the CEC in the future and examining whether using a cloud based VEN is a more suitable solution in this scenario.	Staff notes that Section 110.12(a) applies to the DR control - it would not apply to other controls (such as switches) unless those controls directly integrate and perform their own demand response functions. Buildings have been required to show an ability to reduce lighting in response to a demand response signal for over 10 years; while this is not an operational requirement, staff finds that retaining this minimal ability (and using it to confirm correct installation of the DR control) is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222875	Jonathan Houle (ecobee)	Should the CEC go forward with the implementation of Section 110.12(a), ecobee believes that the use of a cloud-based OpenADR certified VENs should be an appropriate means of complying with CEC's policy goals.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222875	Jonathan Houle (ecobee)	Under a framework where all devices are OpenADR enabled without additional controls to arbitrate third party access, this could cause situations where customers would 1) receive two concurrent DR events which would lead to a significantly altered temperature setpoint causing a customer to opt out of DR program participation or 2) that one event would override another yielding one of the DR aggregators or utilities to not obtain the load impact reductions it expects	Staff finds that the commenter misunderstands the requirement: demand responsive controls are a building-level requirement, and it is up to the builder (and associated design professionals and subcontractors) to design and install the appropriate number, type, and configuration of controls to ensure the building complies with demand response requirements. The specifications do not require that all controls directly incorporate demand response functions.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222875	Jonathan Houle (ecobee)	We recommend that the use of OpenADR VENs be used as a means of complying for 110.12(a) for SMBs and MURB suites (for clarity, not systems applying to common areas in MURBs)	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222875	3/5/2018
222877	Gregory Mahoney (CALBO)	CALBO feels that simplification of the Standards including reinstatement of the index and reformatting of the Standards coupled with elimination of forms that are of minimal value would help to increase acceptance and compliance.	Staff is working internally on indexing the Energy Code, which can occur outside of a rulemaking proceeding. Staff is committed to pursuing opportunities to streamline documentation requirements where appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018

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222877	Gregory Mahoney (CALBO)	The third suggestion for improvement of code compliance is to eliminate installation forms. There is no other code that Building Departments enforce that require the contractor to state that they have complied with the approved plans and code.	Staff notes that the installation form is the "final" form for any system that does not require either HERS rating or acceptance testing. Staff finds that this additional step requires separate documentation from the work of the installer. Staff will, however, look for opportunities to further streamline the documentation requirements, and will work with CALBO to pursue all appropriate process improvements. (Staff notes that certificates of installation are primarily necessary for establishing accountability for proper installation of energy features, thereby enabling enforcement of the Standards and preventing reassigning of responsibility between installers and testers. Additionally, some aspects of energy features require the installer to choose between multiple options in the field, so a certificate of installation informs field verifiers and enforcement agency persons as to which feature to inspect. Maintaining copies of registered certificates of installation support quality assurance follow-up processes, and support home owner grievance proceedings when poor installation quality is discovered long after final inspection. That said, staff is committed to continual process improvement as well as to ensuring that building inspectors are asked to only perform necessary inspections and reviews.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018
222877	Gregory Mahoney (CALBO)	We understand that formatting the Standards to be consistent with the other parts of Title 24 is not an option for the 2019 Standards however; GALBO would like to express support of that effort for the 2022 Standards.	Staff will be looking more closely at the internal structure of the Energy Code as a part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018
222877	Gregory Mahoney (CALBO)	We understand that the CEC is working on reinstating an index to assist code users in navigating the Standards.	Staff is working internally on indexing the Energy Code, which can occur outside of a rulemaking proceeding. Staff is committed to pursuing opportunities to streamline documentation requirements where appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018
222877	Gregory Mahoney (CALBO)	CALBO is taking this opportunity to express concerns regarding the new requirement in Section 150.1(c) 14, for the local jurisdiction to verify the performance of code required photovoltaic systems. It is unrealistic to expect building inspectors to take the time necessary to verify azimuth range as well as existing and future shading of buildings, trees, utility poles and other obstructions. It is just as unrealistic to expect building inspectors to utilize an online satellite mapping tool to verify compliance. Building inspectors and plans examiners are often criticized for not spending the time considered necessary to verify compliance. This requirement, as written, is not a viable option and would only serve to open inspectors to additional criticism. This is not our area of expertise and we have a very limited amount of time to spend verifying compliance with all of the parts of Title 24.	Staff has rephrased this requirement to make clear that building officials are only expected to provide a review of applicable forms, consistent with general processes for reviewing documentation of installed building features.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018
222877	Gregory Mahoney (CALBO)	CALBO is taking this opportunity to express concerns regarding the new requirement in Section 150.1(c) 14, for the local jurisdiction to verify the performance of code required photovoltaic systems. It is unrealistic to expect building inspectors to take the time necessary to verify azimuth range as well as existing and future shading of buildings, trees, utility poles and other obstructions. It is just as unrealistic to expect building inspectors to utilize an online satellite mapping tool to verify compliance. Building inspectors and plans examiners are often criticized for not spending the time considered necessary to verify compliance. This requirement, as written, is not a viable option and would only serve to open inspectors to additional criticism. This is not our area of expertise and we have a very limited amount of time to spend verifying compliance with all of the parts of Title 24.	Staff has revised the requirements applicable to building officials to make it clear that their verification step is ordinary verification of compliance documentation, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222877	3/5/2018

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222878	Gerald Lahr (BayREN)	BayREN encourages the Commission to ensure that efficient electric water heating technology can readily be utilized under any compliance path for any low-rise residential building - prescriptive or performance, and new construction or alteration. We are encouraged by CEC's commitment at the February 5th workshop to expand compliance options for electric water heating. We strongly applaud these efforts, and encourage the Commission to release draft code revisions, supporting guidance, and compliance software improvements as soon as possible so that this guidance can be considered within the context of the 2019 rule making.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	BayREN is supportive of the 2019 proposed changes to expand the range of options to install electric heat pump water heaters in new and existing residential construction.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	BayREN is supportive of the 2019 proposed requirements for mandatory rooftop solar for new low-rise residential construction.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	BayREN recommends that the proposed 2019 Code be amended to provide consistent treatment for the prescriptive and performance paths. This could be done by requiring the use of community solar under the prescriptive path, which BayREN would only recommend if the community solar requirements are also adjusted as proposed above. Alternatively, the exemption for sites with limited solar access could be applied to buildings using both the prescriptive and performance paths.	Staff finds that the community solar provisions added to Part 1 Section 10-115 are available for projects following either the prescriptive or performance path; staff does not find that additional language is necessary to address the commenter's concern. Similarly, exemptions applicable under the prescriptive path are also applied in setting the performance baseline for the performance path, and in this way applly in the manner suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	Section(s): 150.1(b). Section(s): 150.2(a)2; 150.2(b)2. Concern: Compliance software needs to allow for an independent electric baseline for water heating. BayREN requests options be added to the Standards, the Alternative Calculation Method, the compliance manuals, and the compliance software that would provide a fully independent baseline for electric water heating. This should be available without any compliance penalty regardless of whether gas is available if based upon a NEEA Tier 3 heat pump water heater's performance, thereby leveling the "compliance" playing field for all-electric buildings.	Staff notes that this comment relates to the Energy Commission's modeling software and is neither made with respect to a change in the Express Terms nor to proposing a change to the Express Terms. Staff has passed the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	Section(s): 150.1(b). Section(s): 150.2(a)2; 150.2(b)2. Concern: Compliance software needs to allow for an independent electric baseline for water heating. Specific to central water heating systems serving multiple dwelling units, BayREN requests the Commission provide guidance and supporting options within the compliance software to enable central electric water heating systems to be effectively modeled. Currently, the compliance software only allows gas water heating systems to be modeled for central systems. This change, along with BayREN's requested changes to the language in Section 150.1(c)8.B that would allow for a central "water-heating system determined by the Executive Director to use no more energy than that used by the system specified in 150.1(c)8.B.i.", would provide multiple compliance paths for all-electric buildings with multiple dwelling units.	Staff notes that this comment relates to the Energy Commission's modeling software and is neither made with respect to a change in the Express Terms nor to proposing a change to the Express Terms. Staff has passed the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018

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222878	Gerald Lahr (BayREN)	Section(s): 150.1(c)8.A.iii and iv. Section(s): 150.2(a)1.D; 150.2(b)1.H.iii.b; 150.2(b)1.H.iii.c. Concern: Current language limits installation of storage tank for a heat pump water heating system to a garage or conditioned space. BayREN requests CEC add language that would make more locations eligible for the prescriptive approach with edits to: 150.1(c)8.A.iii, 150.1(c)8.A.iv, 150.2(b)1.H.iii.b, and 150.2(b)1.H.iii.c. to include: "the storage tank shall ~~be located in the garage or conditioned space~~ not be located outdoors and shall meet heat pump water heater manufacturer's requirements for ventilation."	Staff has amended 150.2(b)1G to specify "shall not be located outdoors" rather than "shall be located in the garage or conditioned space", consistent with the commenter's suggestion. Staff finds that issues surrounding HPWH location are different for newly constructed buildings, where there is complete design flexibility, and therefore that current prescriptive language to limit the HPWH in garage or conditioned space in 150.1(c)8 is appropriate. (Staff additionally notes that a HPWH location other than the garage or conditioned space can be modeld in the performance method.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	Section(s): 150.1(c)8.B. Concern: Current language only allows gas or propane central systems and does not allow a path for the Executive Director to approve an electric water heating system of equal performance. BayREN requests adding the potential for a prescriptive compliance path for central heat pump water heating using a similar approach for Executive Director approval as offered in Section 150.2(b)1(H).iii.e. BayREN requests edits to: 150.1(c)8.B to include an additional section for "A water-heating system determined by the Executive Director to use no more energy than that used by the system specified in 150.1(c)8.B.i."	Staff has added Section 150.1(c)8C, which reads, "A water-heating system serving multiple dwelling units determined by the Executive Director to use no more energy than the one specified in subsection B above", consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	The Energy Commisison should clarify that "other community shared renewable systems" are addressed and incorporated throughout Section 10-115. Suggest language edits to 10-115(a). See pages 5-6.	Staff finds that the phrase "other community shared renewable system" as stated in the parent Section provides the flexibility suggested by the commenter. Staff does not find that the specific language proposed by the commenter would provide the same assurance that all provisions are still adhered to regardless of the type of shared system.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	The Energy Commission should clarify that requirements for onsite solar electric generation systems as discussed in Section 10-115 are applicable to new residential construction only. See suggested language page 6.	Staff notes that the prescriptive requirement for a solar PV system is only applicable to new construction per the language in Part 6 Section 150.2 (which does not specify compliance with Section 150.1(c)14 for additions or alterations). Staff does not find that additional language to this effect is necessary either in this Section or in Part 1 Section 10-115.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	The Executive Director and the Commission should be granted flexibility in Section 10-115 to approve equivalent mechanisms for providing renewable energy and/or energy storage as may arise, in lieu of rooftop solar or community shared solar. Suggest language edits to 10-115(a); 10-115(b); 10-115(c). See page 5.	Staff finds that a wide variety of approaches are capable of meeting the criteria in 10-115 as written, including those metioned by the commenter; Section 10-115 allows each application to be considered on its own merits, and approved based on a demonstrated assurance of benefit to the tenant or homeowner. Staff does not find that relaxing the criteria of Section 10-115 would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222878	Gerald Lahr (BayREN)	We are concerned that the current proposed requirements for community shared solar make that option difficult or impossible for local building departments to implement and enforce, particularly in developed urban areas. In addition, from a local government perspective, the proposed language has the potential to create tensions with housing affordability, which is a critical issue in the Bay Area.	Staff does not find that the use of an approved program would be difficult to implement or enforce: once a community shared program is approved, subsequent projects must simply adhere to the criteria of the program (as described by the local agency in their approved program application). That is, staff finds that community solar program applications would be reviewed against Section 10-115 by the Energy Commission, not by local AHJs, and are not expected to specify additional residential building components (and therefore not require additional verification or inspection by AHJs). Separately, staff notes that the community solar option is intended to provide local jurisdictions the option to adopt such a program where the program makes economic sense, meaning that it is able to capture a meaningful cost savings compared to installing rooftop solar PV systems on individual dwellings. Staff finds that a community solar program that increases costs relative to rooftop PV installations would not meet the criteria of 10-115 and would not be approved.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018

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222878	Gerald Lahr (BayREN)	We therefore recommend that the Commission allow flexibility to approve equivalent local approaches in addition to community shared solar. The Commission should, for example, have sufficient leeway to approve: 1)Investor Owned Utility (IOU), Public Owned Utility (POU), or Community Choice Aggregation (CCA) programs that supply renewable generation via feed in tariff; 2) Pre-payment of the marginal cost of grid-supplied 100% renewable energy from a Commission-approved program (IOU, POU, CCA, or other) for a period equivalent to the expected useful life of rooftop solar; 3) Either of the above in combination with installation of energy storage configured to provide greater grid harmonization benefit than prescriptive compliance via solar alone; or 4) Other contractual and programmatic options that arise to provide equivalent benefits for renewable energy and/or energy storage.	Staff finds that a wide variety of approaches are capable of meeting the criteria in 10-115 as written, including programs administered by utility providers or aggregators; Section 10-115 allows applications to be considered on their own merits and approved based on a demonstrated assurance of benefit to the tenant or homeowner, and is largely agnostic with respect to program specifics (such as those described by the commenter). To the extent that the commenter is suggesting express allowances for specific arrangements that may or may not achieve the required basic demonstration of equivalent benefit to the homeowner, staff does not find that relaxing the section's requirements would be appropriate given that it could lead to owners and tenants paying additional costs while receiving less benefit, directly contrary to the purpose of the provision. That said, staff has revised the language in 10-115(a)3 to be more clearly agnostic with respect to program specifics, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222878	3/5/2018
222879	Portland General Electric Company	PGE supports the comments submitted by NRDC on the specification for electric water heating with load management for California Title 24 2019 building standards.	Staff notes that the electric water heating load management specification will be considered as a part of the update of the ACM Reference Manual as a possible compliance option rather than within the rulemaking proceeding. (That is, staff finds that the sole question is how to accurately model this equipment within the compliance software, which does not directly relate to provisions in the Express Terms and does not require amendment to consider.) Staff is committed to working with stakeholders with respect to compliance software improvements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222879	3/5/2018
222879	Portland General Electric Company	PGE would add only one additional requirement to the NRDC specification – a requirement for the water heater to use an open standard physical modular interface such as USB or the physical layer of CTA-2045.	Staff finds that imposing an additional requirement for a physical modular interface is likely to have additional marginal costs, and therefore that a cost analysis would be needed for the Energy Commission to consider the requirement. Staff therefore invites the commenter to submit a complete code change proposal regarding this proposed requirement for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222879	3/5/2018
222879	Portland General Electric Company	The early trend of manufacturer's using a proprietary application layer at the demand responsive device and translating it into an "open" protocol in the manufacturer's cloud needs to be changed to an open application layer at the demand responsive device. [...] An obligation for open access at the device may be opposed by some manufacturers and the main reason will likely be that it will diminish the revenue that they can collect by controlling access using a proprietary application layer at the device. This is likely a true argument. However, the importance and accessibility of demand response and flexible loads in a decarbonized future is crucial. The CEC must justify the change in the public interest, or define the requirement in a way that is optional for manufacturers, required only if they want to obtain some type of program benefit.	Staff notes that the current (2016) requirements are for an open application layer at the device; staff has considered the requests by manufacturers for "open access in the cloud", and in particular has found that the demand response market is currently moving in this direction. Staff has therefore added the ability to use a cloud-based virtual end node so as to avoid impeding the current expansion of the demand response market (noting that this approach appears to have the support of California's utility providers). Staff remains concerned by the same potential effects as noted in the comment letter, and will keep a close eye on the demand response market for any evidence that the allowance is creating effects that are against the public interest.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222879	3/5/2018
222879	Portland General Electric Company	Title 24 Section 110.12(a)1: Open access in the cloud will greatly diminish participation of residential customers' demand responsive devices for three general reasons. First, revenue collected by manufacturers for demand responsive behavior will reduce the benefits to customers and 3rd parties. Second, the high cost to 3rd parties of establishing secure connections in the cloud will greatly reduce innovation and access by entrepreneurs and will likely diminish the customer value proposition and adoption. And finally, access in the cloud makes the customer experience for many value propositions too costly and/or difficult, and this will limit the end-state adoption level.	Staff finds that, under the regulations as drafted, entities using a cloud-based VEN to comply with Part 6 are obligated to ensure that utility-generated demand response signals reach intended devices.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222879	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222880	Russell Pate (Rheem)	Any prescriptive requirements in Title 24 of one type of connectivity protocol, or a hardware-based connectivity, for appliances is limiting for product innovation and adds little benefit compared to the cost burden for applying such hardware and integrating its usage with the operation of high efficiency appliances.	Staff does not find that a requirement to minimally include at least one known, effective communications mechanism serves to impede the development or use of additional innovative communications mechanisms. Staff additionally finds that inclusion of one known, effective communications mechanism is appropriate as a minimum standard to ensure appropriate operation of the control.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Any standard requiring hardware-based connectivity is quickly becoming outdated with the emergence of Internet of Things ("IoT") platforms. Overall, having an open-ended controls compliance option for demand response water heaters and other grid-connected appliances would be a better policy decision to assist manufacturers with a vested interest in product innovation and energy efficiency optimization. Rheem would prefer for CEC not to prescribe a singular protocol for utility communications with a device in Title 24. Such a connection standard would limit the use of more encompassing control strategies that would partner well with demand response programs, and set a compliance standard for the next several years based on technology that is becoming quickly outdated in other IoT applications.	Staff has clarified that the requirement to include a baseline communication ability is a minimum requirement, and does not preclude incorporating or using additional communications protocols. Staff has additionally provided an option allowing for the use of a cloud-based VEN, and removed the phrasing "for communication within the building" per comments received from other commenters. Staff does not find that fully eliminating the requirement that the device possess one proven hardware-based ability to send and receive signals is appropriate, as it could lead to non-communicating devices none the less being installed to meet demand response requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	As a result of the federal regulations (10 CFR 431.102 and 10 CFR 431.110(b)) outlined above, the proposed gas-fired storage water heater prescriptive option for low-rise residential buildings needs to be properly modeled by CEC to account for the very different federal minimum energy conservation standards between the above 55 gallon residential gas-fired storage water heaters and the gas-fired storage residential-duty commercial water heaters. It would be improper for CEC to model the energy usage and efficiency between the two types of gas-fired storage water heaters in a home setting with the same energy usage values.	Staff notes that the comment relates to the performance modeling of water heating systems in the CBECC modeling software and not to provisions in code. Staff understands the software to currently accurately model the differences in technology in water heaters designed to different minimum federal specifications; staff will none the less forward the comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Regarding water heating systems for non-residential and residential buildings, Rheem considers the overall simplification of requirements to be a better approach for compliance methods.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Rheem appreciates CEC considering a thorough demand response protocol for connected equipment to operate in a manner to assist utilities in managing energy distribution and to achieve connectivity reliably, with flexibility, and to enhance energy savings. The proposed requirements of "Demand Management" in Section 110.12 provide for proper flexibility of connection options to allow Demand Response programs to work reliably with grid-connected equipment and appliances.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Rheem appreciates CEC including electric heat pump water heaters in the prescriptive requirements for water heating systems in this 45-Day language, as it recognizes electricity-fueled appliances are a better pairing with required home-site electric generation through solar PV panels (or other renewable energy source), and it understands the great energy savings heat pump water heating technology can provide on a state-wide level.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Rheem appreciates the more comprehensive view of achieving energy savings in buildings as well as CEC considering a more fuel-neutral approach in this 45-Day language proposal.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018

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222880	Russell Pate (Rheem)	Rheem would prefer not to manufacture higher cost products including additional required hardware for the State of California. If Title 24 prescribes the use of a certain hardware-based connection standard for grid-connected water heaters, we would have water heater model variants for the California market that include the necessary hardware equipment. Such higher costs for this hardware would be unnecessary due to Rheem also having more inexpensive models using our preferred control strategy and connectivity to achieve the same demand response program objectives. The economies of scale of mass producing products with prescribed hardware would not be achieved due to that path not ultimately being the preferred solution for the market in other demand response programs outside of California.	Staff finds that the specified baseline communication capabilities in Section 110.12(a) include those most commonly deployed in a residential setting (such as wifi), and it is not clear to staff that a specialized communication pathway specific to the water heater (or even more specific to Rheem water heaters) would provide a similar assurance that signals could be received and sent by the water heater once installed. Staff also notes that demand responsive behavior is not required for water heaters under either the prescriptive or performance approach to compliance, and notes that use of a separable module is an option to prevent differences in design of the water heater itself. Staff therefore does not find that the specification in 110.12(a) is unreasonable.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	Section 150.1(c)8.A.ii: With the new requirement of the gas storage water heater having to be more than 55 gallons, CEC is introducing an embedded federally-required energy conservation standard (found in 10 CFR 430.32) that requires a more efficient water heater operating with a power vent or condensing technology that is more costly than a standard atmospheric-vented gas storage water heater. If requiring the more energy efficient gas storage water heating technology is the objective with this new prescriptive option, then allowing the gas storage water heater to have a rated fuel input up to, and including, 105,000 Btu per hour would be in direct conflict with that objective.	Staff has amended the Btu/hr water heating threshold to 75,000 Btu/hr, consistent with the commenter's suggestion and with current federal law.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	The alterations section for low-rise residential buildings needs refinement to align with the current federal energy conservation standards. Section 150.2(b)1.H.iii.d., the recognition of electric water heaters having to be replaced with other electric water heaters is needed. However, the upper limit of 60 gallons for electric resistance storage water heater replacements does not comport with the federal energy conservation standard of any consumer electric storage water heater above 55 gallons having to have heat pump (or heat pump equivalent) water heating technology included (see raised UEF required minimum standards for electric storage water heaters above 55 gallons in 10 CFR 430.32). Therefore, that section should be further revised to state, “For electric resistance only storage type water heaters, the capacity shall not exceed 55 gallons.” This revision will have the Title 24 alterations section align with the higher federal energy efficiency standard requirements for residential electric storage water heaters.	Staff has removed the majority of specification language in this Section so that it now reads, "If no natural gas is connected to the existing water heater location, a consumer electric water heater", thus specifying only that the water heater must comply with applicable appliance efficiency regulations (per the language relating to State and federally regulated appliances in Section 110.0 and 110.1). Staff finds that this ensures alignment with federal law (consistent with the commenter's suggestion) while also using the simplest possible language; staff finds that electric storage water heaters in excess of 55 gallons are already subject to federal appliance efficiency standards that require use of heat pump technology, making unnecessary any further specification in this section.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018

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222880	Russell Pate (Rheem)	The current 2019 prescriptive compliance option draft language for Title 24 with respect to domestic water heating systems in low-rise residential buildings (Section 150.1(c)(8)(A)(iv)) provides for a heat pump water heater meeting the NEEA Advanced Water Heater Specification Tier 3 requirements or higher. The NEEA Advanced Water Heater Specification, Appendix G "Demand Response Validation" provides that the anticipated physical connection for the water heater to be in compliance with CTA 2045. However, we believe this singular focus on the modular control interface for connected equipment minimalizes manufacturer-designed control hierarchies for connected appliances (designed for optimal control and performance by the manufacturers) and prohibits other types of control systems (ex. cloud-based systems) from being used on grid-connected devices.	Staff notes that Appendix G and the associated CTA-2045 specifications are voluntary under NEEA Tier 3: demand response is "optional, but preferred" for this Tier. Neither demand responsive behavior nor compliance with CTA-2045 is required for the noted prescriptive compliance option.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	The Open ADR 2.0 platform provides a proven communications system for utilities to manage demand response and a means to achieve costeffective energy savings for the utility and the customer. Rheem fully supports the use of Open ADR 2.0 and its ability to be integrated within digital, cloud-based control systems for our appliances.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222880	Russell Pate (Rheem)	We believe that additional cost burden for utilities could be avoided if the control and connectivity strategy belongs with manufacturer-developed equipment. Rheem would prefer to provide resources and troubleshoot problems for our customers based on equipment we design, manufacture, and warranty. If it is our control management system causing an operational issue in the field, we would be in a better position to provide a remedy due to already having customer call centers in place and resources dedicated to resolving product issues for our customers.	Staff has added an option for use of a cloud-based VEN, consistent with the commenter's suggestion. (Staff notes that the minimal baseline requirements in Section 110.12 do not preclude the use of manufacturer-driven control and connectivity strategies.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222880	3/5/2018
222882	Bruce Severance (Mitsubishi Electric US)	Addendum to TN 222852. Does not appear to contain comments on the proposed 2019 Standards.	Noted; staff has reviewed, and did not find any comments in the document.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222882	3/5/2018
222883	Russell King (CalCERTS)	Figures 3.2-1 and 3.3-1 are only appropriate to typical split systems. We recommend adding diagrams for soffit mounted units (aka "pancake" units) and fan coil units.	Staff finds that the most appropriate location for additional diagrams is the Compliance Manual; staff will consider adding the noted diagrams to the Manuals.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	Figures RA3.5-1 and RA3.5-2 and similar figures in other sections are missing air barriers on vertical knee walls, dams for loosefill insulation, air barrier at ends of batts, etc.	Staff has added this additional detail, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.2.3 references section RA3.3.4 for airflow measurement. It should reference RA3.3.3.	Staff has made this correction, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3 reads: "Table RA3.1-2 shows the leakage compliance criteria and test procedures that may be used to demonstrate compliance." Recommend changing to "Table RA3.1-2 summarizes the leakage test procedures that may be used to demonstrate compliance."	Staff has amended this language as suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018

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222883	Russell King (CalCERTS)	RA3.1.4.3.1 CalCERTS recommends adding the following language to clarify certain situations that have caused confusion to raters and installers: 1) Floor registers on carpeted floors may be removed and the opening sealed to the floor under the carpet; 2) If allowed by the equipment manufacturer, the installer may seal the airhandler blower compartment access panel with an approved tape, if approved by the manufacturer. Do not use mastic or other permanent sealing material.	Staff has incorporated the clarification suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.1 The last two items, (h) and (i), have a formatting issue. They also reference "compliance criterion from Table RA3.1-2, but the criteria have been removed from the table.	Staff has corrected the erroneous table reference, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.2.1 The last two items (h) and (i), have a formatting issue. They also reference "compliance criterion from Table RA3.1-2, but the criteria have been removed from the table	Staff has corrected the erroneous table reference, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.2.2 The last two items, (h) and (i), have a formatting issue. They also reference "compliance criterion from Table RA3.1-2, but the criteria have been removed from the table.	Staff has corrected the erroneous table reference, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.3 "After installing the interior finishing drywall, or other finishing material, and verifying that one of the above rough-in tests was completed, the following procedure shall be used:"	Staff has incorporated the clarification suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.4 Item (d) "Attach a blower door to an external doorway. If the door between the house and the garage is used, the garage car-bay doors must be open." Items (i) and (j) reference "compliance criterion from Table RA3.1-2, but the criteria have been removed from the table.	Staff has incorporated the clarification suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.6 We recommend item (c) be edited to read as follows: "The system shall pass the test if no visible smoke exits the accessible portions of the duct system, except the furnace cabinet which is gasketed and sealed by the manufacturer."	Staff finds that retaining the current separated format for these criteria is more clear than a merged format.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.7 We recommend the following edits: ~~For altered existing ducts that fail the leakage tests,~~ The objective of this inspection in conjunction with the smoke test (RA3.1.4.3.6) is to confirm that all accessible leaks have been sealed. Visually inspect to verify that the following locations have been sealed: (a) Connections to plenums, evaporator coils, and other connections to the forced air unit; (b) Refrigerant lines, p-traps, and other penetrations into the forced air unit; (c) Air handler door panel (do not use permanent sealing material, metal tape is acceptable); (d) Register boots sealed to surrounding material at all registers and return grilles; (e) Connections between lengths of duct, as well as connections to takeoffs, wyes, tees, and splitter boxes.	Staff has incorporated the clarification suggested by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.1.4.3.9 We recommend the following edit: "An additional performance compliance credit is available for verified low leakage ducts that leak less than the default target if a qualified low leakage air-handling unit is installed."	Staff finds that the additional phrase suggested by the commenter is redundant with the term "low leakage", which is by definition lower than required maximum leakage rates. In addition, the phrasing could be understood to mean that an additional threshold below the "low leakage" threshold is being referred to. Staff therefore finds that retaining the existing language is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018

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222883	Russell King (CalCERTS)	RA3.2.2 (paragraph right after Table RA3.2-1) We recommend the following edits: "The standard charge verification procedure detailed in this section ~~shall~~ may be completed when the outdoor temperature is within the manufacturer's specified temperature range, or the outdoor temperature is 55°F or higher, after the HVAC installer has installed and charged the system in accordance with the manufacturer's specifications. The return dry bulb temperature shall be able to be maintained above 70°F during the test, otherwise the weigh in method can be used."	Staff has corrected the word "shall" to "may", consistent with the commenter's suggestion. Staff does not find that the phrase "able to be" would be appropriate where suggested: it is not enough that this be capable of being done, it must be done.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.2.2.5 Item (b) Liquid line filter driers are a mandatory measure. The statement "if required per outdoor condensing unit manufacturer's instructions" can be deleted.	Staff finds that use of the refrigerant charge verification protocol is not limited to newly constructed systems, thus if an alteration to an existing space conditioning system is made to a refrigerant-containing component that does not use a filter dryer, the mandatory requirement to check for a new filter dryer is not triggered. For this reason, staff finds that the "if required" phrasing is appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.3.3.1.5 Section RA3.3.3.3 is incorrectly referenced. If the target value of 300 is deleted, direction should be provided for where to find the compliance criteria.	Staff has made this correction, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.4.4.2 What is the compliance criterion for this? How does the user know what passes or fails? Does it have to match exactly?	Staff has added the compliance criteria to the end of this section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.5.3.2.10 Moving Gabel Ends from section RA3.5.3.2.5 removes the requirement "The backside of air permeable insulation exposed to the unconditioned attic space shall be completely covered with rigid board insulation or an air barrier." Was this intentional?	Staff has restored this specification, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.5.3.3.4 We recommend clarifying the issue that was addressed in the Blueprint Newsletter, Issue #121, about attics over garages and some version of the following diagram be included (see diagrams on page 5)	Staff finds that the guidance in the Blueprint is more appropriately included in the Compliance Manual; staff has forwarded this recommendation to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	RA3.5.3.4.2 Clearly states that the floor over the garage shall be insulated with batt or blanket insulation against the subfloor, but the first diagram in figure RA3.5-1 shows otherwise.	Staff has clarified the language in this Section along with its diagram, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222883	Russell King (CalCERTS)	Table RA3.1-2 All of the compliance criteria have been removed from this table, presumably because it is in the code language. This now requires having both documents on hand to understand the protocol. It also scatters the information into different sections of the code. CalCERTS recommends that a single table that summarizes the criteria be somewhere in RA3.	Staff notes that the purpose of the Appendices are to supplement the Part 6 language, and are not appropriate to consider standalone documents. For this reason, language in the Appendices that is redundant with language in Part 6 should be minimized where possible. Staff can (and will) consider including a single all-inclusive table in the Compliance Manual.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222883	3/5/2018
222884	Gary Smith (Lighting and Watercon Supply)	Does not appear to be a relevant comment. Commenter is requesting the Energy Commission continue to allow the manual method of filling out compliance forms for indoor and outdoor lighting applications.	Staff notes that the comment does not relate to the proposed amendments to regulation, as it instead relates to the completion of forms. Staff none the less finds that all documentation is becoming digitized for ease of completion (via automation), transmittal and storage, as well as to reduce associated resource costs. Staff needs to balance the concerns of multiple stakeholders with regards to the evolution of compliance forms.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222884	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222886	Chuck Murray (Washington State Department of Commerce)	Proposed Specification for Electric Water Heating with Load Management for California Title 24 - 2019: The primary lack in the requirements is that it does not specify CTA 2045 physical layer components; i.e. the device connections that allow for multiple communication devices to be used on the same physical connection structure. Ultimately, this full compliance with CTA 2045 is what we believe would provide the greatest compatibility with a wide range of future connectivity options ranging from FM radio signal to WiFi to hardwired connections. Over the 15-year life of a typical water heater, there is likely a need for this flexibility as communication devices and security protocols change over time. While the physical connection specified in this version, it would be worth weighing in that the Northwest believes that CTA 2045 physical connection specifications will provide the best value for end-consumers and for the grid over the full life of the water heater.	Staff finds that CTA-2045 can be a mechanism for ensuring that requirements for demand responsive controls are met, noting that Part 6 does not currently require that water heaters be demand responsive. (Staff also notes that water heaters may freely include CTA-2045, and are not restricted to doing so solely in service of demand response requirements.) To the extent that the commenter is requesting that a requirement for water heaters to be demand responsive and meet CTA-2045 specifications, staff finds that a CTA-2045 requirement would be likely to incur marginal costs, and that a cost analysis would therefore need to be provided in order for the requirement to be considered by the Energy Commission. Staff therefore invites the commenter to submit a complete code change proposal relating to this requirement for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222886	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	As noted in our earlier comments filed on February 20, 2018, SEIA and CALSSA disagree with the provision in Subchapter 8 that makes a change to Section 150.1(c)8Biii for multiple dwelling units that would downsize the solar water heating system if a drain water heat recovery system were installed. We recommend retaining the original language in Section 150.1(c)8Biii, and not adding new paragraphs to this section for drain water heat recovery. Section 150.1(c)8Biii would again read: iii. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4 and with a minimum solar savings fraction of either a or b below of 0.20 in Climate Zones 1 through 9 or a minimum solar savings fraction of 0.35 in Climate Zones 10 through 16. The solar savings fraction shall be determined using a calculation method approved by the Commission.	Staff finds that the commenter misunderstands the application and effect of the prescriptive options: the performance of a drain water heat recovery system paired with a solar water heater achieves equivalent overall performance at the solar savings fractions specified (and would be allowable under the performance approach to compliance regardless of including the option here). The language in the Express Terms adds another performance-equivalent option and does not change existing requirements: this is consistent with the policy of providing prescriptive options where equivalent performance can demonstrated (and where other constraints, such as preemption, are not applicable), and staff notes that the commenter does not provide a rationale for withholding the option of using a drain water heat recovery system for prescriptive compliance given that this demonstration has been made. Staff therefore does not find that removing the option would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	CALSSA believes the proposed Exception added to Section 140.5(b)n should be eliminated. However if a genuine concern still remains for high-rise buildings achieving the required solar fraction, we recommend raising the level from eight stories to forty stories. Above forty stories, the amount of available space begins to become constrained.	Staff has removed the eight story exception based on comments that the specific number of floors specified for the exception has not been fully justified within the rulemaking record; staff does not find that switching to 40 floors, rather than eight, addresses this concern. Staff will therefore revisit this topic as part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	CALSSA opposes the proposed Exception added to Section 140.5(b) which allows buildings eight stories or greater to avoid the solar water heating requirement for residential occupancies.	Staff has removed the eight story exception based on comments that the specific number of floors has not been fully justified within the rulemaking record. Staff will therefore revisit this topic as part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	CALSSA recommends adding a solar/electric water heater option to Section 150.1 (c)8A. CALSSA suggests the following language: (v) A solar water heating system meeting the installation criteria specified in Reference Residential Appendix RA4 using an electric resistance backup water heater with a minimum solar savings fraction of 70%. In addition one of the following: a. For climate zones 2 through 15 a photovoltaic system capacity of .3 kWdc larger than the minimum required specified in Section 150.1(c)4; or b. For climate zones 1 and 16, a photovoltaic system capacity of 1.1 kWdc larger than the requirement specified in Section 150.1(c)4	Staff finds that this suggested prescriptive option is not accompanied by any data or analysis by which its equivalency to existing prescriptive options could be determined, nor is it clear why the electric backup water heater would be unable to make use of a heat pump (or restricted from being a gas water heater). Staff therefore does not find that adding this option based solely on this comment would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222889	Evelyn Butler (SEIA and CALSSA)	CALSSA recommends making a change to Section 150.0(j)2. We recommend a separate subsection for solar water heating system collector loops, consistent with CSI Thermal requirements, and removed from the subsection that includes piping for space conditioning systems and steam & hydronic heating systems. We recommend the following changes in Section 150.0(j)2: ~~B. In addition to insulation requirements, all domestic hot water pipes that are buried below grade must be installed in a water proof and no-crushable casing or sleeve.~~ B. Solar water-heating system collector loop piping shall have minimum R 4 insulation. ~~B.~~ C. Piping for space conditioning systems~~, solar water-heating system collector loop~~, and distribution piping for steam and hydronic heating systems, shall meet the requirements of Section 120.3(c).	Staff finds that the R-value suggested by the commenter is less than current requirements, and notes that it is unclear what benefit the suggested change will provide. Staff therefore does not find that the suggested change would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	In Section 150.1(c)14, the annual electrical usage should be a minimum PV system size requirement, not an “equal to” requirement. PV panels have a discrete amount of electrical output for each panel, so the minimum possible size to satisfy this requirement would be the next whole panel or module that satisfies the annual electrical usage, which is likely to be slightly larger than the dwelling’s annual electrical usage.	Staff has amended the language to make clear that the requirements are minimum (not absolute) requirements, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	PV+ESS compliance credit should be allowed at a higher cap for homes in the all-electric case. This would provide an attractive option for builders to fully electrify homes, further reducing GHG emissions. we further recommend additional compliance credit for sizing of PV systems greater than the mixed-fuel estimate of electrical usage – when paired with appropriately sized battery storage – especially for the all-electric case. In addition to an “oversizing” (actually, right-sizing) allowance, there should be a higher cap on compliance credit.	Staff notes that this comment relates to the Energy Commission's modeling software and is neither made with respect to a change in the Express Terms nor to proposing a change to the Express Terms. Staff has passed the comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	SEIA and CALSSA encourage the Commission to carry through all the way to ZNE goals with the 2019 development cycle so as to maximize the benefits of bringing solar and other renewable energy into the power portfolio of California.	Staff finds that the Express Terms achieves zero-net-energy goals in a way that also comports with statutory requirements and restrictions on regulations adopted into Part 6 and program requirements for net energy metering. Staff does not find that elevating zero-net-energy goals above these other considerations would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	SEIA and CALSSA supports the incorporation of system verification with existing inspections as carried out by the respective building departments.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	SEIA and CALSSA would like to re-emphasize our previous comments on Demand Management from our letter of February 21, 2018; we appreciate the updated revisions from the Commission and the opportunity to continue collaboration on improving the language. Section 110.12 describes the mandatory requirement for demand management systems. We encourage the Commission to make this section’s requirement flexible in communications standard implementation.	Staff has clarified the mandatory requirements in Section 110.12 to emphasize flexibility and added the ability to use a cloud-based VEN, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018

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222889	Evelyn Butler (SEIA and CALSSA)	To augment our previous comments of our letter to the Commission of October 20, 2017 in which we stressed the importance of any monitoring should be done at the system level, we submit the following proposed language revision: JA11.5.1 Remote Monitoring Capability The PV system shall have a web based portal and a mobile device application that at a minimum provide the dwelling occupants access to the following information for the entire PV system: (a) The nominal kW rating ~~the PV system~~. (b-e unchanged) (f) Current kW production ~~of the entire PV system~~.	Staff finds that the suggested change would not have a substantive effect on the requirements of JA11, and does not find that the change improves the clarity of JA11.5.1. Staff therefore does not find that making the suggested change would be appropriate, noting that the existing language allows monitoring at the system level consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	We recommend complete strike-out of Exception 6 of Section 150.1(c)14. We believe Exception 6 would not be used – or worse – could be applied inappropriately. We are concerned that consultants might inappropriately reduce specified minimum PV system size, believing they are saving their client money, and that this exception would cause confusion.	Staff finds that there is value in providing options even in cases where use of the option may prove uncommon; staff does not find that there is a likelihood of inappropriate application of the option given that the criteria for the battery system is both clear and simple. Staff finds that customers who end up later desiring additional panels for their PV system are likely to be able to buy and install such panels, thus even in the case noted by the commenter it is not clear that a harm is created if they begin by purchasing (or leasing) a minimally sized system and later find it appropriate to increase its size (versus paying for a larger system from the outset).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	We recommend the following change to Section 150.1(c)14, Exception 4: EXCEPTION 4 to Section 150.1(c)14: In all climate zones, for low-rise residential dwellings with three habitable stories and single family dwellings with three or more habitable stories, the minimum PV size shall be the smaller of a size that can be accommodated by the minimum solar zone area specified in Section 110.10(b) or a PV size required by the Equation 150.1-C, but no less than 0.8 Watt DC per square foot of conditioned floor area.	Staff finds that in context, specification of "PV size" in the exceptions aligns with amended section language stating that the installed system must have a size equal to or greater than that determined by equation 150.1-C. For this reason, staff does not find that adding the word "minimum" would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222889	Evelyn Butler (SEIA and CALSSA)	We recommend the following revision for Joint Appendix JA11, Section JA11.8: JA11.8 Enforcement Agency The local enforcement agency shall verify that all Certificate of Installations are valid and that the PV systems meet all provisions of JA11. ~~For verification of the minimal shading criterion in JA11.3.1, the local enforcement agency shall verify the array physically or use an online satellite mapping tool approved by the Executive Director to evaluate the solar access availability of the building location.~~ The AHJ will inspect for safety. We believe it is unrealistic to expect building department staff to use an online satellite mapping tool.	Staff has rewritten this section to clarify that building inspectors are intended to provide a review of associated documents inclusive of submitted shading information (and are not required to conduct a direct verification of shading), consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222889	3/5/2018
222890	Mia Marvelli (CBSC)	Because these proposed code changes affect multiple state agencies, the CBSC would like to conduct a Coordinating Council meeting so this may be publically discussed amongst the state agencies. During the November 14, 2017 Coordinating Council meeting some of these concerns were identified but have yet to be resolved.	A CBSC coordinating council meeting was conducted on April 26, 2018. CBSC responding indicating that any conflicts with Par 6 would be addressed during the during the 2018 Triennial Code Adoption Cycle prior to their adoption into the 2019 edition of the California Building Standards Code. No change to Part 6 required. https://efiling.energy.ca.gov/getdocument.aspx?tn=223382	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222890	3/5/2018
222890	Mia Marvelli (CBSC)	CSBC believes that the California Energy Commission proposed Part 6 MERV 13 filter requirements present a conflict with existing code provisions in the CALGreen Code, Section 5.504.5.3 which requires at least a MERV 8, Tier 1 and Tier 2 reach standards for MERV 11 and 13 respectively, and the California Mechanical Code Section 503.3 which references and restates the CALGreen Code Section 5.504.5.3 for filters. CBSC believes that these potential conflicts in the regulations violate the nine-point criteria found in Health and Safety Code Section 18930 (a).	A CBSC coordinating council meeting was held on April 26, 2018 in response to this issue. Following inter-agency discussion, CBSC and stakeholder agencies indicated that the best solution for all agencies was to address conflicts with Part 6 during the during the current Triennial Code Adoption Cycle, thereby harmonizing the building standards prior to their adoption into the 2019 edition of the California Building Standards Code. No change to Part 6 required. https://efiling.energy.ca.gov/getdocument.aspx?tn=223382	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222890	3/5/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222891	Tristan de Frondeville (SkyCentrics)	Section 110.12(a): As a Company that is leading the way in advancing grid-interactive water heating and hydronic systems, it is supportive of the Commission's recommendation on demand response and load management.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 110.12(a): Consistent with the comments submitted by NRDC proposing a specification for compliance credits for the utilization of grid-interactive electric water heating for load management to the 2019 amendments, it becomes more imperative that the Commission clarify the scope, technology, and applicability of Section 110.12.	Staff notes that the language in Section 110.12(a) moves existing requirements from JA5 into Part 6, and does not include consideration of compliance credits (which can be established via applicable subsections of Part 1 Section 10, and relate almost exclusively to the Energy Commission's building modeling software). Staff therefore is considering the request for compliance credit as relating to this software and not to the Express Terms, and has forwarded this request to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 110.12(a): The Company urges the Commission to ensure that in any ensuing final amendments that a technology neutral approach is taken regarding communication protocols for connected devices and appliances. While this may, and certainly should, include OpenADR 2.0(a) and (b), it should also include protocols like CTA-2045, which is being implemented by manufacturers, utility partners, and third-party aggregators.	Staff finds that the Express Terms permits the use of CTA-2045, and that a CTA-2045 communications module can comply with Section 110.12 (that is, it can receive a signal that has passed through a cloud-based VEN and received via one of the noted communication). The Express Terms also references NEEA Tier 3, which includes a voluntary provision relating to CTA-2045. Staff does not find that CTA-2045 was identified early enough in the process for a complete presentation to and consideration by stakeholders, nor is enough information about the standard present in the rulemaking record for staff to consider direct incorporation into Section 110.12. Thus, staff does not find that incorporating the standard into Part 6 would be appropriate; staff instead will work with stakeholders to pursue consideration of this standard as a compliance option or assist stakeholders in preparing a code change proposal for the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 110.12(a): The Company would urge the Commission to more clearly delineate which buildings are covered under the requirement.	Staff notes that Section 110.12(b), (c) and (d) specify the circumstances where demand responsive controls are required, and Section 110.12(a) specifies general requirements applicable to the controls themselves. Thus, the Section's applicability is not dependent on building type, but on the factors specified in Section 110.12(b), (c) and (d).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.0(n)(1)(A): The Company is supportive of clarifying that a dedicated outlet be installed closer to the water heater.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.0(n)(1)(D): While the requirement to install a gas supply line with a capacity of at least 200,000 Btu/hr is not a new requirement under the 2019 amendments, the provision is yet another example of a requirement that on its face advantages the installation of gas tankless water heaters. The size of a gas supply line, and the cost associated with its installation, should be made by the homeowner in conjunction with the builder. California's building code should not continue to force all homeowners to subsidize the costs of installing a 200,000 Btu/hr gas supply line in homes.	Staff notes that no change is proposed in the Express Terms for this provision. None the less, staff finds that this requirement allows customers to decide whether they want a storage gas, condensing storage gas or instantaneous gas water heater as a replacement, consistent with technology neutrality and with the proposed parallel requirement to include a receptacle suitable for use by an electric heat pump water heater. The cost of using a 3/4 inch gas line in place of a 1/2 inch line during new construction is about $76, which is less than 1/10 the cost of retrofitting a larger gas line and ensures compatibility with all potetial gas equipment options. Staff additionally finds that this approach is consistent with commenter requests that the homeowner be in position to decide on what type of water heating system is appropriate for their circumstances, as opposed to being limited by decisions made by the builder prior to sale.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(b)(1): The Company agrees with commenter Air-Conditioning, Heating, and Refrigeration Institute ("AHRI"), that thermal storage systems should receive parity with battery storage systems,	Staff notes that the comment appears to relate to the Energy Commission's compliance software and not to changes proposed in the Express Terms. None the less, staff finds that batteries are more effective at load shifting than water heaters as they are potentially useful in affecting the entire load of the house (including HVAC, lighting, water heating, and plug loads); this larger effect necessarily creates a larger credit in the software. Other load shifting strategies, such as thermal storage, thermal mass, precooling, and smart thermostats can only affect one load and not the plug loads or the entire house load, meaning that modeled energy impacts (and derived compliance credits) smaller. Staff finds that artificially inflating the credit for these other strategies beyond their modeled impact on overall energy use would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(b)(1): Tthe Company encourages the Commission to adopt a proposed specification for the utilization of grid-interactive electric water heating for load management to the 2019 amendments as outlined by commenter National Resources Defense Council ("NRDC").	Staff notes that this comment relates to compliance modeling software and not to the proposed changes to regulatory text that are a part of the rulemaking proceeding. Staff will include modeling of additional storage and demand flexibility options (and associated energy benefits/credits) as a part of updating its compliance modeling software.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(i, iii, and iv): The Company is generally supportive of the inclusion of electric heat pump water heaters ("HPWH") being added as compliance options, however it is unclear as to the legality of requiring the pairing of those products with solar PV systems in newly constructed low-rise buildings.	Staff finds that this pairing is allowable under law; that said, staff has added a prescriptive option that does not rely on this pairing, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018

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222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(i, iii, and iv): The Company is unclear why the Commission would require that a HPWH be tied to a solar PV system in certain Climate Zones. Requiring the pairing of the two technologies may add additional costs associated with installation of the HPWH, which could be a deterrent for builders and disadvantage HPWHs which the Commission has recognized is a highly energy efficient water heating technology solution for consumers. The Company believes that would be the wrong signal to send to the marketplace. The Company would recommend that the Commission eliminate the pairing requirement for HPWHs and solar PV systems in all Climate Zones.	Staff has added a prescriptive option that does not rely on this pairing, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(i, iii, and iv): The Company is unclear why the requirement is also modified by the word “single” when in the amendment to 8(A)(i) the Commission modifies /contemplates “One or more” tankless water heaters.	Staff notes that the prescriptive storage options are based on the assumption that one (1) water heater will be installed in the dwelling. Storage water heaters have standby losses, and any additional storage water heaters will increase the total standby loss of the system. Instantaneous water heaters do not have standby losses. (in both cases, additional water heaters can be assumed not to increase the total water heating load of the dwelling.) In addition, the additional instantaneous water heater will likely be installed close to an end-use point such as the master bathroom, which will reduce the overall pipe length of the system and reduce energy use overall. For this reason, the prescriptive option for instantaneous water heaters may permit any number of such heaters whereas the prescriptive option for storage water heaters must specify and assume a specific number. Staff therefore finds that the language in the Express Terms is appropriate, noting that additional storage water heaters can be modeled and installed under the performance method.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): While the Commission rests its justification for this amendment on the Quality Insulation Installation (QII) requirement for all new low-rise buildings, that in no way justifies the prohibition of selling a certain category of water heating equipment that is compliant with federal law. The Company would recommend that the Commission simply eliminate the gallon size restriction.	Staff notes that this class of product is not banned, and can be modeled and installed under the performance standard; a lack of prescriptive compliance option for a device is not a prohibition of said device. That said, staff has added a prescriptive option to account for storage water heaters of all sizes.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): DWHR systems are a nascent technology, and given the Commission’s own findings on the number of installations in the State, it does not appear to be appropriate to include this option at this time in the 2019 amendments.	Staff finds that this equipment has been shown to provide feasible energy savings, and therefore appropriate to consider within the context of Part 6. (While low adoption would justify removing a requirement to install this equipment, as this is merely one option among several staff find it appropriate and consistent with policy to allow for greater adoption	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): Pursuant to the comments submitted by the Bradford-White Corporation as well as AHRI, the Company does not support the Commission’s proposal to eliminate from commerce in the State of California, gas or propane storage water heaters with inputs of 105,000 Btu per hour or less and rated storage volumes of less than 55 gallons. On its face this amendment is a quintessential case of the Commission taking consumer choice away and advancing one technology (e.g. tankless) over tank type water heaters. There are numerous highly efficient gas and propane water heaters below 55 gallons that fit the needs of many families in California.	Staff notes that this class of product is not banned, and can be modeled and installed under the performance standard; a lack of prescriptive compliance option for a device is not a prohibition of said device. That said, staff has added a prescriptive option to account for all sizes (i.e., gallon capacities) of water heaters. (Staff notes that the btu per hour rating specified in the Express Terms is consistent with federal definitions for this equipment, and therefore finds that changing the btu per hour specification would not be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): the amendment’s option regarding hot water piping insulation is equally curious given the Commission’s proposal under Section 150.0(j) regarding all piping insulation on cold water (from a storage tank) and hot water lines. If insulation is required why is this option under (ii)?	Staff has removed the language from Section 150.1(c)8Aiii referring to pipe insulation requirements, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): The CASE Report addresses a number of potential impediments to the technology’s adoption least of which is ensuring that that the State’s “greywater” regulations are harmonized with the proposed DWHR proposal and that statewide energy savings on the proposal were not calculated.	Staff finds that the Part 11 greywater requirements are not mandatory (they are one of several available options that can be freely chosen) and therefore not in conflict with the DWHR language. (Staff notes that the commenter does not specify in what way compliance with Part 11 greywater requirements would be mutually exclusive with the use of DWHR; staff does not find any evidence that these provisions would be mutually exclusive.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018

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222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): The Company believes that the Commission should give time for these appliances to be installed in California, and allow more of these value propositions to be determined and evaluated before preventing their installation entirely.	Staff has added prescriptive options to cover all gallon sizes of residential water heaters, consistent with the commenter's suggestion. Staff notes that water heaters above the federal Btu/hr limit are able to be installed under the performance approach - the absence of a prescriptive option for using commercial water heaters in residential construction does not act to prohibit the installaiton or use of this type of equipment.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): The Company recommends that the DHWR system compliance option be removed.	Staff finds that providing DWHR as an optional alternative is consistent with recognizing the benefit that can be provided by these devices and of providing additional options to builders where equivalent performance can be demonstrated via performance modeling.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): The Company would observe that it could not find in the record of the Docket a single instance explaining why DWHR recovery systems should not be applied to tankless water heating systems	Staff notes that the three prescriptive options for gas water heating provide the same level of performance for the water heating system; staff finds that the additional requirement is necessary for storage water below 55 gallon because of the lower level of performance of this class of water heater relative to instantaneous water heaters (presuming, in all cases, minimum compliance with federal efficiency standards).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.1(c)8.A(ii): While a builder could certainly design a compact system that utilizes a storage tank water heater – and some may – taken together with other elements of Title 24 what incentive(s) do they have to do so?	Staff notes that Part 6 is intentionally technology neutral whenever possible. The 3 different prescriptive options for gas water heater provides the same level of performance for the water heating system. The additional requirements for storage water below 55 gallon is needed because of the lower level of performance of this class of water heater relative to instantaneous equipment (presuming both to be minimally compliant with federal efficiency standards).	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.2(b)(1).H: Consistent with the Company's comments above, as well as other commenter AHRI, the Company recommends that the Commission decouple the water heater from the solar PV system requirements. HPWHs should stand on their own given the technology's inherently high energy efficiency savings for consumers.	Staff has removed the photovoltaic requirement from this section, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222891	Tristan de Frondeville (SkyCentrics)	Section 150.2(b)(1)H.(iii)(d): While the Company infers from the proposals use of the modifier "only" that electric resistance storage type grid-enabled water heaters would be allowed under the amendment, the Company recommends that the Commission seek to clarify this by simply referencing the applicable federal law covering these products.	Staff has rephrased for clarity, consistent with the commenter's suggestion: the intent of this prescriptive requirement is for the replacement water heater to be a residential water heater, consistent with the federal definition(s) in 10 CFR 430.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222891	3/5/2018
222892	Bart Croes (CARB)	We also concur with the proposed requirement for 2-inch deep filter slots, or 1-inch slots for systems meeting specified airflow performance criteria.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	We also support the proposal for verification of Home Ventilating Institute (HVI) certified product ratings for kitchen range hoods.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	We also supports the proposed requirement for Home Energy Rating System (HERS) verification of the HVI certified ratings for installed kitchen range hoods.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	We especially support your staff's proposal to require higher efficiency air filters for all new buildings statewide and for new HVAC systems installed in existing buildings.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	We fully support your efforts to maintain and improve both indoor and outdoor air quality while pursuing increased energy efficiency in California buildings.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	We support the statewide application of this higher efficiency filters requirement proposed by your staff, rather than a regional requirement, for several reasons: in addition to infill considerations, most of the State experiences unhealthful levels of particles at some time during the year, and with changing climates and increasing disasters, we cannot always predict where exceedances will occur. A statewide requirement will provide equal protection to all citizens in new construction and make implementation and enforcement much easier	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222892	Bart Croes (CARB)	While we would prefer to see MERV 16 filters required in order to remove a greater percent of the smaller particles from the air, we support the proposed move to MERV 13 based on greater ease of implementation and enforceability.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018

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222892	Bart Croes (CARB)	Your staff has done an excellent job in highlighting the seriousness of the particle pollution problem throughout California, with maps showing that a majority of our state, especially the most populated areas, do not yet fully meet national and state PM10 and PM2.5 ambient air quality standards. The use of higher efficiency filters statewide is a straightforward approach to reducing exposures to particles and their health impacts.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222892	3/5/2018
222894	Robert Raymer (CBIA)	CBIA supports the current CEC proposal to have local building departments perform the field inspection and verification of residential rooftop PV systems as opposed to adding this to the growing list of HERS verification items. At least for the initial roll-out of the state mandate for residential solar, the inspection and verification of all rooftop PV systems installed on new residential construction can be performed by California building officials during the normal course of construction inspection. Should the CEC find this to be inadequate, it can be addressed in future code updates. CBIA supports the CEC's position to leave solar off the HERS verification requirement.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222894	3/5/2018
222899	Arnold Wilkins	Response to a submission by Philips.	Staff finds that the commenter is correct in their assertion that NEMA 77 does not address phantom array effect created by TLA on human health.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222899	3/6/2016
222900	Jon McHugh (McHugh Energy)	McHugh Energy recommends that the CEC and their consultants participate in the IES standard development process to assure that California's public interest is represented and to better evaluate if this IES standard would be suitable for use in a future Title 24 and Title 20 standard	Staff notes that this recommendation does not relate to the Express Terms; staff has forwarded this comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222900	3/6/2019
222900	Jon McHugh (McHugh Energy)	McHugh Energy recommends that the CEC continue to collect the data in the JA10 format for the 2019 code cycle. This data is critical to supporting a data-driven update of the flicker standard in the 2022 Title 24 code cycle.	Staff notes that the Express Terms does not include changes to JA10.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222900	3/6/2019
222900	Jon McHugh (McHugh Energy)	McHugh Energy recommends that the CEC retain the current flicker requirements in JA8.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222900	3/6/2019
222900	Jon McHugh (McHugh Energy)	The CEC should start a deliberative process for setting the flicker limits for the 2022 code cycle. I am also supportive of processing the data so that the NEMA 77 metrics of Pst and SVM are also collected and posted in a public database. The crosscomparison the JA10 and NEMA 77 metrics would be desirable and require only a little extra processing of the same data. I also recommend that EPIC program consider research on the effects of different modulation depths and frequencies of light on human physiology, health and performance.	Staff expects (based on received public commentary) to revisit NEMA 77 as a part of the 2022 rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222900	3/6/2019
222905	Jon McHugh (McHugh Energy)	Contents identical to TN#222900	See comments and responses noted for TN#222900	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222905	3/6/2019
222906	Chris Primous (MaxLite)	JA 8.4.5 Lumen Maintenance, Rated Life and Survival Rate: Include language that makes it clear that SSL filament lamps that are 2200K and 2500K CCT can utilize same "early certification" life test methods as all other CCTs of LED lamps.	Staff finds that the purpose and intent of the changes in the Express Terms is to fully align JA8 life testing to current ENERGY STAR® specifications and procedures. Staff does not find that further amending ENERGY STAR program requirements and creating new inconsistencies between ENERGY STAR testing and compliance testing for California would be appropriate. (Staff fully intends to keep these references current; to the extent that the ENERGY STAR's concerns with regards to this technology can be addressed and the associated program requirements updated, staff would propose updating the associated test procedure references to that version once available.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222906	3/6/2018

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222906	Chris Primous (MaxLite)	Table 150.0-A Classification of High Efficacy Light Sources: Allow Safety Listed miniature SSL lamps with ANSI base types G4, GY6.35, and G9 to be automatically classified as high-efficacy light sources for T24. Further conditions should also be included for these products that such lamps must be Safety Listed using language similar to the electrical safety requirements found in ENERGY STAR Lamps V2.1 sec. 11.1.	Staff is not able to find a physical limitation applicable to LED components that would make complying with JA8 infeasible from a technical perspective, noting that flicker and power factor are largely a function of the associated driver (which may be incorporated into the luminaire rather than the lamp). Staff invites the commenter to submit a complete code change proposal for the 2022 rulemaking that includes technical information substantiating the technical infeasibility of applying specific JA8 requirements to these form factors (noting that this would be likely to lead to specific exceptions to, or alternate standards for, specific requirements within JA8 rather than a blanket exception to JA8 compliance). Regarding safety listings, staff notes that all requirements for ENERGY STAR testing, including requirements that devices possess safety certifications, are applicable under JA8. (Only two amendments are made to the scope of the ENERGY STAR tests, and only as necessary to ensure all possible products seeking JA8 certification are accounted for.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222906	3/6/2018
222906	Chris Primous (MaxLite)	JA 8.5 Marking: Maintain JA8-2016 marking exemption for lamps and LED light engines with diameters less than 1.0" and decorative lamps with diameters less than 2.0."	Staff does not find that base diameter correlates with available marking area, and for this reason has proposed to remove the table language that excepted certain lamps based on base diameter. Staff does not find retaining this exception to be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222906	3/6/2018
222906	Chris Primous (MaxLite)	JA 8.6 Data Reporting: Simplify and streamline the MAEDBS database prior to the new product type called "T20 LAMP."	Staff notes that this comment relates to the Energy Commission's database for storing and displaying listings for products certified as complying with California efficiency requirements, and does not relate to the Express Terms. Staff has forwarded this comment to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222906	3/6/2018
222909	Won K Henry Han	Superceeded by TN 222915.	See responses for TN 222915	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222909	3/5/2018
222910	Robert Shearer	It is recommended that the following change be made. Acceptance Testing of the two PAFs (140.6 (a) 2. H. "daylight dimming plus OFF" 140.6 (a) 2. I. "occupant sensing control(s) … in large open plan office areas) in question can be required by appending these two lines of code to section 130.4 (a): 8. Certifies that lighting systems receiving the Daylight Dimming plus OFF Power Adjustment Factor comply with Section 140.6(a)2H and Reference Nonresidential Appendix NA7.6.1.2.1 (e) 3. … and … 9. Certifies that lighting systems receiving the Occupant Sensing Control Controlling the General Lighting in Large Open Plan Office Areas Above Workstations Power Adjustment Factor comply with Section 140.6(a)2I and Reference Nonresidential Appendix NA7.7.6.1	Cross-linked in Simon's and the ATTCP comment logs.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222910	3/6/2018
222914	Tom Graber (Emery Allen LLC)	Rebuttal to MaxLite comment on Table 150.0-A Classification of High Efficacy Light Sources regarding ability of certain form factors to comply with JA8.	Staff appreciates the additional data provided by the commenter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222914	3/7/2018
222914	Tom Graber (Emery Allen LLC)	Supports other three MaxLite comments/recommendations.	See responses to TN 222906.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222914	3/7/2018
222914	Won K Henry Han	SECTION 140.6 (a)-1: Adverse opinion to limit out the quantity of the lighting system in the energy code. Isn't it enough to limit the total energy, as to not limit the number of lighting systems?	Staff finds that the commenter misunderstands the purpose of the interlock provisions. In general, all of the lighting within a space compared against a limit on total energy. The interlock provisions account for situations where a builder or designer wants the lighting within the space to be considered part of two separate, mutually exclusive systems so as to only count the wattage of one of the two systems towards this limit: the noted spaces all commonly have "house lighting" and "stage lighting" systems that would not normally be lighting the space simultaneously. In all other cases, all of the lighting in the space is simply summed and compared against the total limit, consistent with the commenter's suggestion; staff does not find that removing the ability to interlock (and deduct) a second system when necessary would be appropriate, nor does staff find that allowing more than one additional lighting system to be installed without counting towards the total prescriptive limit would be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018

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222915	Won K Henry Han	SECTION 140.6 (a)-1: Recommend adding the definition of "Lighting System"in this section. It is not clear if "Lighting System" refers to the type of lighting fixtures (ex. Recessed downlight, wall washer, sconces?) or more likely refer to the type of applications (ex, general lighting, lighting for features, the lighting for cleaning?) or for something else?	Staff does not find that phrasing referring to the lighting system of the building is using these terms outside of (or inconsistent with) their dictionary definitions and plain language meaning in referring *in toto* to a system that provides lighting within a building or space (irrespetive of specific fixture types or applications included in or served by the system). Staff therefore does not find that a formal definition is necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (a)-1: There should be many other interior room types desiring more than a lighting system in addition to the listed 5 room types, such as "corridor/circulation (especially high-rise residential buildings)", toilets, laboratories, pantry area, broadcasting room, indoor swimming pool, and others for better lighting environment to meet the various living/working styles.	Staff does not find that these other areas generally have, or require, separate and mutually exclusive lighting systems such that inclusion in the interlock exception would be appropriate. Staff notes that the number of systems in a building or space is not otherwise limited by Section 140.6(a), which specifies that "The adjusted indoor Lighting Power of all proposed building areas is the total watts of all planned permanent and portable lighting systems in all areas of the proposed building", underline added.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (a)-3-S: In the recent sign lighting technology, the designers/architects often design "media wall lighting" with DMX controllable LED system in the architectural interior spaces. Further clarification may be needed for the definition of "Lighting for Signs." Some media wall system is truly designed for the advertising purposes, so it displays the product/brand's information. But, sometime, the system is also designed for the architectural feature lighting to display abstract dynamic lighting effects, so the designers consider them as "lighting for signs."	Staff finds that questions of when a "media wall" would be considered a sign versus another type of lighting (or considered a display rather than a lighting device) are best addressed in the Compliance Manual and other guidance documents; staff will monitor emerging questions relating to these devices to see if definitional changes within the regulations become necessary.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (c)-3-G: Can the architectural wall niche be considered as "wall displays" if it is designed for displaying some paints or objects within?	Staff notes that this appears to be a compliance question, rather than a comment suggesting a change to the Express Terms; "wall display lighting" is defined as "supplementary lighting required to highlight features, such as merchandise on a shelf, which is displayed on perimeter walls." There is a complementary definition of "floor display lighting": "supplementary lighting required to highlight features, such as merchandise on a clothing rack, which is not displayed against a wall." Thus. the lighting would be either wall display lighting or floor display lighting based on whether the object in the niche is mounted on the wall of the niche or not.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (c)-3-G: It is unclear the definition of"Wall displays." Is this referring to some objects/products /artworks highlighted? Or does this also refer to architectural wall feature lighting, such as the special walls expressed by special architectural wall material, differently with other walls. Can the lighting for this feature wall be considered as "wall display lighting"?	Staff notes that this appears to be a compliance question, rather than a comment suggesting a change to the Express Terms; in most cases wall washes would be considered wall display lighting, however staff cannot provide a definitive answer without a more specific example or question. (Staff does not find that the relevant language in the regulations is unclear such that a change would be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (c)-3-G: It states the wall display lighting luminaire should be mounted greater than 10'-6" from the floor. What if the wall display case attached on the wall is lower than this height, but it has the internal wall display lights within the case?	Staff notes that this appears to be a compliance question, rather than a comment suggesting a change to the Express Terms; in most cases the lighting being referred to would be considered case display lighting rather than wall display lighting (for the reason noted by the commenter), however staff cannot provide a definitive answer without a more specific example or question. (Staff does not find that the relevant language in the regulations is unclear such that a change would be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222915	Won K Henry Han	SECTION 140.6 (c)-3-G: What if 6ft wide display object attached on 12ft wide wall and the entire wall is lit by the single lighting system. Can the lighting for full width of wall be considered as "wall display lighting" or only 6ft portion shall be considered for it?	Staff notes that this appears to be a compliance question, rather than a comment suggesting a change to the Express Terms; the calculation of lighting power allowance under the tailored method provides specific answer to this question in Section 140.6(c)3G. (Staff does not find that the relevant language in the regulations is unclear such that a change would be appropriate.)	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018

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222915	Won K Henry Han	SECTION 140.7 Table 140.7-B: Client and people's demand and expectation regarding the facade lighting in the urban environment (Specially in Lighting Zone 4) gets more complex and greater thru time. With LED lighting technology, unlikely with the old facade lighting method which uses the flood lights, the current building facades can be lit as one of important urban component as "urban canvas" to express the project's identity to the city, and even sometimes it delivers the urban messages to people. If we consider the facade lighting as "special lighting application" in the exterior lighting category, we may not consider the facade lighting as one of "general lighting" in the exterior lighting power allowance. Likewise, Title 24 allows additional lighting power for "Qualified lighting systems" for the interior features or/and certain interior lighting system which is not used for the general lighting, we can also consider to allow additional power allowance for this facade lighting, especially in Lighting Zone 4, where the facade lighting is considered as one of important urban feature in the city.	Staff notes that the requirements in Section 140.6 and 140.7 are prescriptive requirements based on the wattage needed to meet the IES recommended illuminance levels for lighting applications (including facade lighting). The performance approach to compliance is available for those situations where additional lighting power is needed.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222915	3/5/2018
222929	Naomi Miller	Correcting previous public comment regarding flicker. SVM and Pst together are incomplete and will not address higher frequency flicker (such as 400 Hz).	Staff notes that the Express Terms does not propose to allow use of NEMA 77 in place of JA10; staff appreciates the additional data related to this topic.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222929	3/8/2019
222929	Naomi Miller	Correcting previous public comment regarding flicker. The existing California flicker standard only addresses frequencies up to 200 Hz, and only prevents the worst of flicker.	Staff notes that the Express Terms does not propose to allow use of NEMA 77 in place of JA10; staff appreciates the additional data related to this topic.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222929	3/8/2019
222929	Naomi Miller	Correcting previous public comment regarding flicker. The IEEE P1789 standard is too conservative in places. I've now seen 15% flicker at 100 Hz (incandescent lamps in Europe) and can't detect any flicker. Furthermore, the IEEE standard doesn't take duty cycle into account, and 1250 Hz is visible through the phantom array effect at 100% flicker when the duty cycle is extremely low (below 10%).	Staff notes that the Express Terms does not propose requiring the "low effect" or "no effect" levels for flicker specified in IEEE P1789, and is therefore consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222929	3/8/2019
222930	Naomi Miller	Cover letter for TN 222929.	Staff has reviewed; no comments appear to be present in the cover letter.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222930	3/8/2019
222951	Todd Gottshall	The Linear Feet of Sash/10000 cf triggers for requiring automatic sash closures will apply to almost all labs with more than a 1 or 2 hoods. In those cases, the labs are likely not required to be VAV due to Minimum Ventilation of 4-6 ACH driven by client/EH&S guidelines. Please consider adding a cfm trigger of 20,000 CFM or similar to exempt smaller labs from the VAV and sash closure requirements similar to the 5000 CFM trigger for DCV/VAV in Kitchen Exhaust Systems.	Staff notes that the commenter misunderstands the requirements: automatic sash closures are only required *if* the system is already required to install a VAV system (140.9(c)1). This measure is not changing the VAV requirements.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222951	3/13/2018
222952	Todd Gottshall	Please consider revising so that the fan limitations and compliance paths of 140.4 apply to Lab Exhausts but keeping the limitation that is intended to exclude induction fans. Suggested language revision: B. The allowable exhaust fan system power demand shall not exceed the watts per cfm of exhaust air as determined by the calculations of Section 140.4c. Exhaust air does not include entrained air, but does include all exhaust air from fume hoods, hazardous exhaust flows, or other manifolded exhaust streams; or	Staff does not find that relaxing requirements relating to use of variable air volume equipment would be appropriate, based on the supporting information in the Documents Relied Upon.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222952	3/13/2018

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222952	Todd Gottshall	We don't agree that the fan power should be limited to 0.65 kw/cfm because it is too low and too restrictive but rather it should follow the criteria set in 140.4 which allows for the design of systems that are Constant Volume and Variable Volume with adjustments.	Staff finds that Exceptions 1 and 2 to Section 140.9(c)1 provide for use of constant volume systems where appropriate, and that otherwise use of varlable volume systems is feasible and cost effective as an energy saving measure. Separately, staff has increased the fan power limit to 0.85 for systems with air filtration, scrubbers, or other air treatment devices, and added an exception for cases where applicable local, state, or federal exhaust treatment requirements specify installation of air treatment devices that cause more than 1 in. of water pressure drop, consistent with the commenter's suggestion that 0.65 could be too limiting in some circumstances.		3/13/2018
222964	IBPSA-USA San Francisco Bay Area Chapter Board	The IBPSA-USA San Francisco Bay Area Chapter have considered the proposed change to the 2019 Building Energy Efficiency Standards; ACM Approval Manual, "1.1.5 Alternative Nonresidential Energy Simulation Engines", and discussed it in an open forum. On behalf of our members, we would like to support the Energy Commission's decision to allow software vendors to propose using an alternative energy simulation engine for nonresidential compliance modeling. We have polled all of our members and there is unanimous support for the proposed change.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222964	3/14/2018
222976	IBPSA-USA Los Angeles Chapter Organizing Committee	We take issue with the following proposed language: "The vendor shall not establish differing compliance rules from those that have been approved by the Energy Commission for use in the Compliance Manager." We encourage the Energy Commission to clarify this language so that it does not constrain alternative engines from using strategies and technologies for the proposed design model simply because they have not been implemented in the ACM or the compliance manager.	Staff notes that this comment relates to the Energy Commission's building modeling software, and neither relates to changes in the Express Terms nor proposes a change to the Express Terms. Staff has forwarded this comment on to appropriate personnel.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222976	3/14/2018
222976	IBPSA-USA Los Angeles Chapter Organizing Committee	We wholeheartedly support the CEC's decision to implement the proposed language of the new section 1.1.5 regarding the ability for nonresidential software to use alternate simulation engines.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222976	3/14/2018
222976	Noah Horowitz (NRDC)	We encourage the Commission to review the comments submitted by the Statewide Codes and Standards program and to adopt their recommendation to restore the stringency of the building energy code by requiring all three controls (daytime, scheduling and vacancy) for those applications that have required vacancy controls in the past.	Staff has reviewed the submitted materials and revised the Express Terms to clarify the requirements for automatic scheduling controls, for motion sensing controls, and for when daylight is available. We have clarified the Express Term in order to make it clear that there is no deleted requirements from current energy code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222977	3/15/2018
222977	Noah Horowitz (NRDC)	We have learned that the proposed language that covers Controls on Outdoor Lighting removes a portion of the requirements for scheduling controls, which has been part of the code since 2013. Its removal puts some of the sizable statewide energy savings from State required advanced light controls at risk.	1. There is a misunderstanding of the code requirement since 2013 in the comment that scheduling control is required in addition to motion controls for those applications where motion controls are required. The existing requirement of Section 130.2(c)2 is about outdoor lighting to be controlled separately from other electrical loads. Also, all outdoor lighting are required to be turned off automatically for a portion of the night.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222977	3/15/2018
222977	Pete Strasser (International Dark Sky Association)	We are asking the California Energy Commission to assure Section 130.2(c) Controls for Outdoor Lighting are more stringent than they were in the 2016 building efficiency standards.	We have revised the Express Terms to clarify the requirements for automatic schedulding controls, for motion sensing controls, and for when daylight is availble. We have clarified the Express Term in order to make it clear that there is no deleted requirements from current energy code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222978	3/15/2018

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222977	Pete Strasser (International Dark Sky Association)	We do not support of the California Energy Commissions proposed standards for Section 130.2(c) Controls for Outdoor Lighting.The 45 Day Express Terms for Section 130.2(c), would allow for those outdoor luminaires where vacancy controls are required, to control based on daylight and vacancy and not install scheduling controls as has been required since the 2013 standards. This saves less energy than a lighting system that is controlled by all three control types including a scheduling control. We recommend that the Commission modify this section to restore the stringency of the building energy code by requiring all three controls (daytime, scheduling and vacancy) for those applications that have required vacancy controls in the past. (see language pages 4-5)	There is a misunderstanding of the code requirement since 2013 in the comment that scheduling control is required in addition to motion controls for those applications where motion controls are required. The existing requirement of Section 130.2(c)2 is about outdoor lighting to be controlled separately from other electrical loads. Also, all outdoor lighting are required to be turned off automatically for a portion of the night. We have revised the Express Terms to clarify the requirements for automatic schedulding controls, for motion sensing controls, and for when daylight is availble. We have clarified the Express Term in order to make it clear that there is no deleted requirements from current energy code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222978	3/15/2018
222978	Pete Strasser (International Dark Sky Association)	We are asking the California Energy Commission to assure the updated standards for Section 130.2(b) Luminaire Cutoff Requirements for Outdoor Lighting are more stringent than they were in the 2016 building efficiency standards.	Staff finds that the previous wattage-based threshold for cutoff requirements would vary in "stringency" based on the lumen per watt efficacy of the lighting device, and as this threshold was established based on pre-LED lighting technologies moving to a lumen-based threshold has the effect of increasing the stringency of this requirement as it relates to LED devices to be equivalent to that of other technologies, consistent with the commenter's suggestion.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222978	
222978	Pete Strasser (International Dark Sky Association)	We do not support of the California Energy Commissions proposed standards for Section 130.2(b) Luminaire Cutoff Requirements. An energy-based regulatory body cannot sanction waste by design. If light is not directed to the task, it is waste empirically, pure and simple. Allowing up light, meaning emitting light in a direction not in accordance with The Task, is doing just that. There is no energy allowance or product design and use to justify light not directed to the task at hand, and to do so is completely counter to the word and spirit of Title 24. For these reasons, no luminaire of a BUG “U” rating of 2 or higher should be permitted. There exists some up light measured in photometric tests from even the smallest support brackets that can give an up light rating of 1. For this reason the value of 2 or higher should be restricted. (see language pages 4-5)	The scope of the 2019 rulemaking does not include any changes to the BUG "U" rating or the uplight rating to outdoor luminaires required for meeting Title 24 Part 6. We cannot consider the commenter's suggestion change based upon the rulemaking proceeding.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222978	3/15/2018
222988	Eddie Moreno (Sierra Club CA)	We support increased controls innovation as long as it provides more energy savings. Thus we support the exceptions that would allow advanced controls such as bilevel motion controls that have different unoccupied dimming levels by time of night or with respect to elapsed time since motion was last detected. The Statewide Codes and Standards program has submitted a letter dated February 20th with suggested outdoor lighting controls code language that we support. (see language page 5)	We have revised the Express Terms to clarify the requirements for automatic schedulding controls, for motion sensing controls, and for when daylight is availble. We have clarified the Express Term in order to make it clear that there is no deleted requirements from current energy code. There is a misunderstanding of the code requirement since 2013 in the comment that scheduling control is required in addition to motion controls for those applications where motion controls are required. The existing requirement of Section 130.2(c)2 is about outdoor lighting to be controlled separately from other electrical loads. Also, all outdoor lighting are required to be turned off automatically for a portion of the night.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222988	3/16/2018
222988	Eddie Moreno (Sierra Club CA)	We recommend that the Commission modify Section 130.2(c) to restore the stringency of the building energy code by requiring all three controls (daytime, scheduling and vacancy) for those applications that have required vacancy controls in the past.	We have revised the Express Terms to clarify the requirements for automatic schedulding controls, for motion sensing controls, and for when daylight is availble. We have clarified the Express Term in order to make it clear that there is no deleted requirements from current energy code.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222988	3/16/2018

Comment #	Commenter	Summary of the Comment	The Commission's Response to the Comment	Link	Date
222988	Eddie Moreno (Sierra Club CA)	HCD recommends that hotel/motel and all residential occupancy be exempted from Section 130.2(b). We disagree with HCD's recommendation to roll back the scope of the environmental protections afforded by the cutoff requirements. We appreciate that HCD has identified a problem in the current structure of the requirements. We recommend that the following text be inserted into the residential mandatory Section 4.106 "Site Development" portion of CALGreen: 4.106.5 Light pollution reduction. Outdoor luminaires of 5,500 lumens or greater subject to the cutoff luminaire requirements in Title 24, part 6 Section 130.2(b) including applications in Title 24, part 6 Section 150.0(k)3 items B though D that reference Section 130.2, shall comply with the maximum zonal lumen requirements for Backlight, Uplight, and Glare in accordance with Section 5.106.8.	Staff notes that changes to mandatory CALGreen requirements are outside the scope of both this rulemaking (for updates to Part 6) and the parallel Part 11 rulemaking to update the voluntary energy provisions in two of its appendices. Staff will coordinate with CBSC and others on future updates to CALGreen to potentially use a lumen threshold in place of a wattage threshold, following deployment and observation of the requirement in Part 6.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222988	3/16/2018
222988	Eddie Moreno (Sierra Club CA)	We support the changes to 45 Day Express Terms which has replaced the 150 Watt threshold with the 5,500 initial lumen threshold.	Staff appreciates the comment of support.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222988	3/16/2018
223026	Rob Hammon (BIRAenergy)	The Commission should not adopt a Battery Storage Credit as currently proposed in the 2019 Energy Efficiency Code update. The proposed Storage Credit targeting batteries is driven by a few different factors and these driving factors are all inappropriate reasons to push batteries into new homes. (see pages 2-5)	Staff finds that recognition of the value provided by on-site storage is fully appropriate in the context of Part 6 on its own and in the broader context of Energy Commission and State of California goals and policies: on-site storage further minimizes grid interaction and associated stress, helps to address issues of timing relating to when energy is generated and when it is demanded (increasing self-utilization and avoiding curtailment of renewable generation), and enables the use of more advanced and more effective demand management strategies.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/22/2018
223026	Rob Hammon (BIRAenergy)	The Commission should provide a Storage Credit for High Performance Envelopes with thermal-energy storage. A compliance credit for High Performance Envelopes would push the new construction market to build High Performance Envelopes. This would benefit builders, homebuyers, homeowners, and all the people of California by reducing energy use, energy bills, and greenhouse gas emissions, while increasing the longevity of the homes' structure and the comfort of the occupants	Staff notes that improving the building envelope already results in additional compliance credit due to its impact on the modeled energy use of the building; staff finds that artificially inflating the credit for envelope improvements beyond their modeled impact on overall energy use would not be appropriate.	https://efiling.energy.ca.gov/GetDocument.aspx?tn=222852	3/22/2018